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14. ABSTRACT
During the past quarter, we have continued to work with RFL/AAG and DHA to secure de-identified behavioral and performance data on Soldiers who participated in the SAAT training; we received positive reviews for the manuscript submitted to JPSP on the immediate training effectiveness of the SAAT study and we have worked on the revision and additional analyses in response to reviewers' comments. The revised manuscript was re-submitted to JPSP. In addition, we have worked on fine-tuning the SAAT training material for the closeout of the study; we've also completed the recording of SAAT training videos for each of the training session.

15. SUBJECT TERMS
Social resilience, Cohesion, Leadership, Isolation, Depression, Perspective Taking

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EXECUTIVE SUMMARY

The Social Awareness and Action Training (SAAT) was funded by the Comprehensive Soldier and Family Fitness and the Medical Research & Material Command. It was a research project led by scientists at the University of Chicago to develop and scientifically test a training package that focuses on social resilience, and it was designed to alter the social cognition, emotion, and behavior of Soldiers and Platoons. The SAAT training material has been finalized, and the training program is completed with participation of Soldiers from Fort Sill and JBLM. At Fort Sill, the baseline assessment, SAAT training, and posttest assessment of 16 platoons were completed in February, 2013; the short-term follow-up survey was completed in May 2013; and the one-year follow-up questionnaire was distributed electronically along with an on-site visit to encourage Soldier participation in February 2014. At JBLM, the baseline assessment, SAAT training, and posttest assessment of 32 platoons were completed in June, 2013; the short-term follow-up survey was completed in November 2013; and the one-year follow-up questionnaire was completed in July 2014 (following the same procedures as used at Fort Sill to ensure comparability of data collection across bases). Response rates for the follow-up assessments have been poor, whether the assessments were secured on site or via a web-based interface. To secure evidence beyond self-reports for training efficacy, we have collaborated with MAJ Paul Lester and his team from the Army's data facility to request and analyze behavioral and performance data on the Soldiers who participated in the SAAT training. A manuscript (see Appendix A) for the immediate training effect (pre-post analyses) of SAAT study has been submitted to JPSP. The results of multilevel modeling analyses indicated that social resilience, as compared to cultural awareness, training produced small but significant improvements in social cognition (e.g. increased empathy, perspective taking, and military hardiness) and decreased loneliness, but no evidence was found for social resilience training to generalize beyond these training foci nor to have adverse effects. SAAT training material (full, two-hour refresher, and family versions) and instruction videos have been prepared and finalized. If these training results are judged to be effective, CSFF's intent is to incorporate this training package into the Army Resiliency Directorate.

BODY

PROJECT MILESTONES

- Phase 1: Develop and estimate the efficacy of the SAAT training (MAY 2011 – APR 2012)
    - Developed and tested Social Fitness and Cultural Awareness training in focus groups, Fort Bliss, July 2011.
    - Revised training material in light of focus group feedback
    - Implemented Pilot Test #1, Joint Base Lewis McChord, September 12-19, 2011.
        - Data analysis completed and pilot results reported, September 23, 2011.
    - Established a secure, reliable, and fast "Soldier to Statistics" computer network, database, and statistical analysis system to ensure the

research outcomes are evaluated objectively and accurately in accordance with best practices in data management and statistics.
    - Revised training material in light of pilot test feedback
    - Presented the revised SAAT to LTC Dennis McGurk, LTC Jeffrey Thomas, and Dr. Amy Adler at the Walter Reed Army Institute for Research (WRAIR), November November 17, 2011; revised SAAT based on the feedback we received at WRAIR
    - Hired and trained former NCOs with training experience to adapt the language of SAAT to Soldiers and to serve as the lead Trainers for SAAT
    - Implemented Pilot Test #2, Fort Sill, March 12-16, 2012.
        - Data analysis completed and pilot results reported, March 18, 2012.
    - Revised training material further in light of second pilot test results and feedback. A brief outline of the training material is available in Appendix B, and the full training material package is uploaded with the submission of this report.
    - Provided additional training to the former NCO's who would be overseeing the trainers hired for the next phase of the project.
    - Hired and trained 8 former NCOs with training experience, January 2013, for Phase 2
- Phase 2: Conduct a Randomized Intervention Study to Determine Training Efficacy (MAY 2012-NOV 2013)
    - The PI met with MG McDonald and his Chief of Staff, COL Dunn in September, 2012, to ask for brigades to participate in SAAT. (As originally proposed and funded, FORSCOM was to task brigades with this training.) MG McDonald agreed to provide two brigades.
    - Achieved a test of Social Fitness training by implementing a randomized double dissociative clinical trial design
        - 16 Platoons from one brigade at Fort Sill, Feb 4-Feb. 8, 2013. The second brigade had scheduled for SAAT on Jan 28-Feb 1, 2013, but the brigade was deployed in late December, 2012. One Platoon from this brigade was available, however, and we trained the Platoon on Jan 28-Feb 1 to provide the (new) Trainers with in vivo experience with SAAT.
        - 32 Platoons from one brigade at JBLM, June 3-7, 2013. The 3-month follow-up training and assessment at JBLM is tentatively scheduled for September, 2013, and the one-year follow-in June, 2014.
    - Preliminary analyses of the pretest-posttest data from Fort Sill and JBLM indicate negligible differences between bases, so we are testing the hypotheses described in our proposal that immediately post-training:
        - social resilience will be greater for Soldiers in the Social Fitness than the Cultural Awareness Condition,
        - performance will be better for Soldiers in the Social Fitness than the Cultural Awareness Condition,
        - outgroup prejudice (i.e., prejudiced attitudes toward Afghan people) will be diminished to a greater degree in the Cultural Awareness than the Social Fitness Condition, and

        - baseline characteristics of the Soldiers (e.g., baseline risk, age, military rank) will be related to post-training measures of social resilience and performance.
- Phase 3: Conduct a Long-Term Evaluation of Training Efficacy (DEC 2013 – AUG 2014)
    - Completed the "3-month" follow-up training and assessment was completed at Fort Sill in May, 2013 and at JBLM in November, 2013. About 40% of the platoons trained in June at JBLM were unavailable until mid-November. We, therefore, scheduled the short-term follow-up for 20-21 NOV 2013 at JBLM. Although the interval is 5 rather than 3 months, the high attrition earlier on the JBLM calendar and the low participation rates for the 3-month follow-up at Fort Sill led to the decision to defer this training/assessment until most of the Soldiers had returned to JBLM.
    - In the original proposal, all Platoons were going to be deployed to combat. With the withdrawal from Afghanistan, most of the Platoons were not deployed to combat.
    - Completed the one-year follow-up assessment at Fort Sill and JBLM. The assessment was distributed electronically along with an on-site visit to encourage Soldier participation in February 2014 at Fort Sill. The electronic distribution of the one-year follow-up was what had been proposed, and this decision was reinforced when we confirmed with the command at Fort Sill that the majority of the Soldiers trained in Feb 2013 would not be at Fort Sill for the one-year follow-up. Soldiers from the platoons that we trained in Feb 2013 were contacted by email and provided a link to complete a web-based survey. The annual IRB review at the University of Chicago and Army included IRB approval for Soldiers who accessed this survey to receive a $10 gift card for their participation. The same procedures were used at JBLM in June, 2013 to ensure consistency in data collection across bases.
    - Response rates for the follow-up assessments have been poor, whether the assessments were secured on site or via a web-based interface. To protect against this possibility and to secure evidence beyond self-reports for training efficacy, we have planned from the outset to collaborate with MAJ Paul Lester and his team from the Army's data facility in California to analyze behavioral and performance data on the Soldiers who participated in the SAAT training. The plan remains to access the relevant de-identified data no later than August 2014; the preliminary work to make this possible has begun.
- Phase 4: Dissemination and Transition Plan (SEP 2014-MAR 2015)
    - In Phase 4, we completed the data analyses; finalized training manuals and materials (including instruction videos) for the Army; developed a 2-hour version of the SAAT and a full family version of the SAAT; prepared technical reports for the Army, and prepared a manuscript on the immediate (pre-post analyses) training efficacy for publication in JPSP. The process for getting the requested de-identified behavior and performance data has taken longer than we initially had hoped for, and the resulting data was not of sufficient quality due to large number of missing data. As a result, we were only able to conduct limited

amount of additional analyses with the requested information. At the time of this report, we are still waiting for the last batch of the remaining requested data to be release from DHA. The analyses results of the SAAT training efficacy were reported in the manuscript we submitted to JPSP and will be summarized in the next section.

SUMMARY OF FINDINGS

The manuscript "Building Social Resilience in Soldiers – A Double Dissociative Randomized Controlled Study" in Appendix A provided details on the methodology of the study. Multilevel modeling analyses were conducted to evaluate a double-dissociative randomized controlled design on the efficacy of the SAAT training, to determine the short-term training effects, generalization effects beyond training, and possible adverse effects. To minimize Type I error rate, outcome measures were identified and organized within Variable Sets, and the experimental hypotheses were tested at the level of Variable Sets. Univariate tests to examine the specific effects of the training were interpreted only when the tests of the corresponding aggregate measure reached statistical significance. The five sets of variable groups identified were: Social Cognition, Work Group Attitude, Afghanistan Cultural Awareness and Outgroup Prejudice, Potential Resilience Training Generalization, and Potential Adverse Effects of Resilience Training on Health and Wellbeing.

Both arms of the SAAT training produced significant improvement in the specific domain in which the platoons were trained. Soldiers in the Social Resilience Training, compared to Afghanistan Cultural Awareness Training, showed an overall improvement in social cognition, with follow-up analyses indicating that the Social Resilience Training condition decreased feelings of loneliness and increased empathy, perspective taking, military hardiness, beliefs in social fitness, the use of the social operations and skills they were taught.

Variable set #1 - *Outcome measures of social resilience: I. Social cognition*

	Group*Time Coefficient					
Outcome variables	**B**	**SE**	**P[1]**	**ID level SD**	**Adjust [2]**	**Effect size**
Overall test - variable set #1	0.13	0.07	0.04	0.61	1	0.21
Beliefs in social fitness	0.12	0.06	0.02	0.52	1	0.22
Empathy	0.11	0.05	0.02	0.37	1	0.29
Generalized trust	0.02	0.02	ns	0.29	1	0.09
Hostility	-0.01	0.02	ns	0.15	-1	0.08
Military hardiness	0.12	0.05	0.01	0.70	1	0.16
Perceived isolation	-0.54	0.31	0.04	4.66	-1	0.12
Perceived social fitness	0.02	0.05	ns	0.62	1	0.03
Perspective taking	0.10	0.05	0.04	0.45	1	0.21
Practicing social skills	0.13	0.04	0.00	0.42	1	0.31

On the other hand, Soldiers in the Afghanistan Cultural Awareness Training, compared to Social Resilience Training, showed specific and significant improvements in their perceptions of Afghans, and follow-up analyses indicated that the changes most evident by the end of training were found for the Soldiers' knowledge of Afghanistan, the perceived warmth of Afghans and, consequently, reductions in the perceived differences in warmth between Americans and Afghans (i.e., reduced outgroup prejudice).

Variable set #3 - Measures of Afghanistan knowledge, social prejudice, and cultural awareness

	Group*Time Coefficient					
Outcome variables	**B**	**SE**	**P[1]**	**ID level SD**	**Adjust[2]**	**Effect size**
Overall test - variable set #3	-0.51	0.05	< 0.001	0.33	1	-1.52
Cultural awareness (Afghan knowledge)	-1.63	0.11	< 0.001	0.70	1	-2.33
Outgroup prejudice - warmth	0.61	0.10	< 0.001	0.95	-1	-0.64
Outgroup prejudice - competence	0.00	0.10	ns	0.79	-1	0.00
Perceived competence of Afghans	-0.09	0.08	ns	0.65	1	-0.13
Perceived warmth of Afghans	-0.67	0.08	< 0.001	0.72	1	-0.92
Perceived competence of Americans	-0.08	0.06	ns	0.59	1	-0.14
Perceived warmth of Americans	-0.04	0.07	ns	0.60	1	-0.07

As for the Work Group Attitude and Potential Resilience Training Generalization, Soldiers in the Social Resilience Training condition did *not* show overall improvements in how they felt about their platoon or the Army, or how they felt about and interacted with family and friends. On the positive side, these findings suggest that the survey responses were not an artifact of demand characteristics, expectancy effects, or placebo effects, but these findings also question whether any improvements in Soldier resilience were achieved beyond specific targets of training. A second possibility is that, as in the case of physical fitness, it may not be sufficient to know or to begin to practice social fitness behaviors, it may also take time for these social behaviors to reshape the Soldiers' interpersonal relationships and collective identities and then only if the Soldiers continue to exercise what they learned during training. If this is the case, then the putative spillover effects of Social Resilience Training may take time and practice to manifest.

In addition, no evidence for an overall adverse effect was detected in the present study but, as in the case of potential spillover effects, any adverse effects may also take time to manifest so continued assessments of potential adverse effects is warranted. The following table summarizes the overall test results for each Variable Sets:

	Group*Time Coefficient					
Overall test	**B**	**SE**	**P[1]**	**ID level**	**Adjust**	**Effect**

				SD	²	size
Variable set #1 – Social cognition	0.13	0.07	0.04	0.63	1	0.21
Variable set #2 – Work group attitude	0.03	0.03	Ns	0.46	1	0.07
Variable set #3 – Outgroup prejudice	-0.51	0.05	**< 0.001**	0.33	1	-1.52
Variable set #4 – Generalization	0.02	0.05	Ns	0.51	1	0.04
Variable set #5 – Adverse effects	0.05	0.04	Ns	0.72	1	0.07

Results from exploratory moderator analyses provided no evidence that the training was harmful. Depressive symptomatology was involved in two significant interactions involving a moderator: depressive symptomatology *decreased* following Social Resilience Training in Soldiers who did not attend religious services but was not changed by training in Soldiers who did; and depressive symptomatology *decreased* more following Social Resilience Training in Soldiers who reported a history of childhood trauma than in Soldiers who did not. For Soldiers in the Afghanistan Cultural Awareness Training condition, neither moderator was related to the change in depressive symptomatology following training.

Several moderator analyses point to individual characteristics or circumstances in the Army that may promote Social Resilience Training efficacy. For instance, Soldiers high in openness, conscientiousness, and agreeableness and Soldiers who have not been previously deployed appeared to benefit more from Social Resilience Training condition than Soldiers low in these personality dimensions or who had been deployed previously. *The latter effect raises the possibility that providing Social Resilience Training early rather than later in a Soldier's career may produce larger training effects.*

Note, however, that most effect sizes for the Social Resilience training are small, in the .05-.15 range. These effect sizes are generally consistent across a range of measures, however. An important distinction between the Social Resilience and Cultural Awareness training was that the former was designed to change beliefs, social cognition, and social behaviors – outcomes that are resistant to change through the operation of a set of forces including personality, habits, and ideologies. Cultural Awareness training, on the other hand, was designed to increase their knowledge about the diversity of the Afghan people through increasing their knowledge of the history, culture, religions, and politics of Afghanistan. The Soldier's initial knowledge about these topics was quite low, whether or not they had been deployed previously, and eight hours of intensive training on these topics had a substantial impact on their knowledge about Afghanistan. This training did little to change the Soldier's beliefs in the competence of the Afghan people but, as specifically targeted, it did increase the Soldiers' knowledge of the diversity of the Afghan people and of many of their similarities to our own citizens.

Together, the results revealed the dissociated effects that would be expected if the training was effective and specific.

KEY RESEARCH ACCOMPLISHMENTS

1. Final versions of the training material for both arms (Social Resilience and Cultural Awareness) of the SAAT training developed, implemented, and evaluated.
2. Trainers' guides developed and finalized with detailed instruction for the trainers to utilize in preparation for the delivery of the training.
3. Video recording of the training sessions created to provide a wider array of training materials as well as more complete materials for use when selecting and training the trainers.
4. Two-hour refresher version of the SAAT training material developed and implemented.
5. Family version of the SAAT training material developed and archived. This version of the training aims at the Soldiers' family members as the target audiences.
6. SAAT training and data collection was completed at Fort Sill and JBLM.
7. The assessment of immediate pretest/posttest training efficacy has been completed, with results submitted in a manuscript to the Journal of Personality and Social Psychology.
8. The evaluation of the immediate SAAT training efficacy indicated that both arms of the SAAT training achieved the intended training outcomes.
9. Soldiers in the Social Resilience Training, compared to Afghanistan Cultural Awareness Training, showed an overall improvement in social cognition, with follow-up analyses indicating that the Social Resilience Training condition decreased feelings of loneliness and increased empathy, perspective taking, military hardiness, beliefs in social fitness, the use of the social operations and skills they were taught.
10. Soldiers in the Afghanistan Cultural Awareness Training, compared to Social Resilience Training, showed specific and significant improvements in their perceptions of Afghans, and follow-up analyses indicated that the changes most evident by the end of training were found for the Soldiers' knowledge of Afghanistan, the perceived warmth of Afghans and, consequently, reductions in the perceived differences in warmth between Americans and Afghans (i.e., reduced outgroup prejudice).
11. No adverse training effects were found from the SAAT training program.

REPORTABLE OUTCOMES

1. The PI presented the Class of 1951 Distinguished Lecturer for General Psychology for Leaders at the United States Military Academy, where he presented the foundational research for this project, emphasized the importance for leaders to understand the social vulnerabilities and resilience of Soldiers and platoons in the Army, and spoke briefly about the SAAT study.

2. A publication in *Scientific Reports* testing a component of our training – the characterization of social pain as coopting and acting through the physical pain system (Cacioppo, S., Frum, C., Asp, E., Weiss, R., Lewis, J. W., & Cacioppo, J. T. (2013). A quantitative meta-analysis of functional imaging studies of social rejection. *Scientific Reports, 3,* 2027. DOI: 10.1038/srep02027.)

3. A manuscript "Building Social Resilience in Soldiers – A Double Dissociative Randomized Controlled Study" was submitted to the *Journal of Personality and Social Psychology* documented the methodology and immediate training efficacy of the SAAT program. This manuscript is currently under review. Preliminary word is encouraging.

4. The SAAT Project includes the randomized clinical trial to evaluate training efficacy and long-term impact. Figure 1 (below) presents the CONSORT Chart summarizing the sample sizes from each base at each measurement period. The measurement periods depicted in Figure 1 are as follows:

T1 (Pretest) and T2 (Follow-up/Posttest): Administer the SAAT Social Resilience and Cultural Awareness Training at Fort Sill and JBLM

Platoons randomly assigned to SF or CA training
One 2-hr block per platoon per day for each of 5 days
Fort Sill: 16 Platoons (4-8 FEB 2013)
JBLM: 32 Platoons (3-7 JUNE 2013)

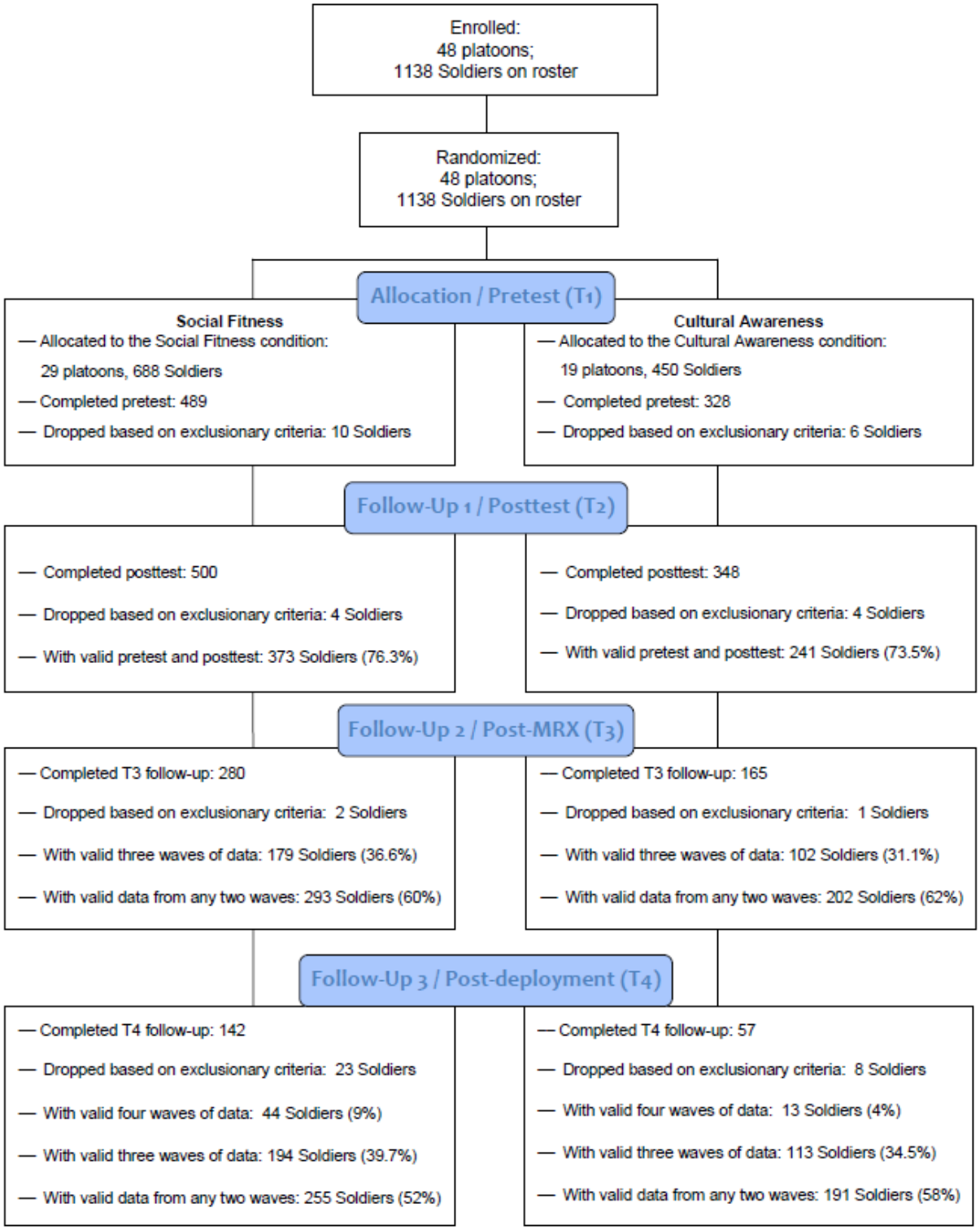
T3 (Follow-up 2): Administer pre-deployment assessment & booster session 1-4 months after initial training (2 hrs/platoon)

Fort Sill (2 MAY 2013)
JBLM (19 NOV 2013)

T4 (Follow-up 3): Administer one-year post-training assessment (web-based survey)

Fort Sill (FEB-MAR 2014)
JBLM (JUN-JUL 2014)

Figure 1. CONSORT Flow Diagram for Social Awareness and Action Training (SAAT).



CONCLUSIONS

The evaluation of the immediate training efficacy of SAAT showed that the training improved social cognition and lowered loneliness in the social resilience (intervention) group, and decreased outgroup hostility (viz., increased warmth) toward Afghans in the cultural awareness (active control) group. The effect sizes were small but statistically significant, in accord with the experimental hypotheses. Importantly, the nature of the design ruled out the operation of placebo, Hawthorne, or expectancy effects because these artifacts have the same effects on both sets of dependent variables – those targeted in the social resilience training and those targeted in the cultural awareness training. From the outset, we have held that a strong test of training efficacy is whether these changes endure and increase resilience and improve performance. For this reason, we scheduled the follow-up training and assessment to permit participation of as many Soldiers as possible, and we sent staff members on base to encourage Soldier participation. The experimental attrition for the follow-up assessments has nevertheless proved to be high. The 3-month and one-year surveys of Soldiers were underpowered and unrepresentative of the whole as to provide little useful information.

This circumstance was considered a possibility at the outset of the SAAT and was a major reason for the inclusion in SAAT of the proposal to collaborate with MAJ Paul Lester and his team from the Army's data facility in California to analyze behavioral and performance data on the Soldiers who participated in the SAAT training. (A second reason for this important component of SAAT was to address possible criticisms of the empirical evidence for CSF2 training being limited to potentially biased self-report outcomes). The process to access the additional data turned out to be difficult and time-consuming, and the majority of the resulting data was of poor quality due to large number of missing records likely resulted from inconsistency in data recording/archiving practices across different Army agencies. These data have not been compiled previously, and the problems we encountered can be identified and solved only by supporting the important work being performed by MAJ Lester and colleagues.

With the SAAT training shown to be immediately effective on the targeted foci, and no potential adverse effects were found, the SAAT training material is proven to be a good addition to the Army Resiliency Directorate. Additional research is warranted to determine the long-term durability, safety, and generalizability of the SAAT social resilience training.

REFERENCES

Adler, A. B., & Dolan, C. A. (2006). Military hardiness as a buffer of psychological health on return from deployment. *Military Medicine, 171*, 93-98.

Adler, A. B., Bliese, P. D., McGurk, D., Hoge, C. W., & Castro, C. A. (2009). Battlemind debriefing and Battlemind training as early interventions with Soldiers returning from Iraq: Randomization by Platoon. *Journal of Consulting and Clinical Psychology, 77*, 928-940.

Adler, A. B., Litz, B. T., Castro, C. A., Suvak, M., Thomas, J. L., Burrell, L., McGurk, D., Wright, K. M., & Bliese, P. D. (2008). A group randomized trial of critical incident stress debriefing provided to U.S. peacekeepers. *Journal of Traumatic Stress, 21*, 253-263.

Ahronson, A., & Cameron, J. E. (2007). The nature and consequences of group cohesion in a military sample. *Military Psychology, 19*, 9 – 25.

Allen, N. J., & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance, and normative commitment to the organization. *Journal of Occupational Psychology, 63*, 1-18.

Avolio, B. J., & Bass, B. M. (2009). Multifactor Leadership Questionnaire (Third Edition). Menlo Park, CA: Mind Garden, Inc.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan, Eds., *Self-Efficacy Beliefs of Adolescents (pp.* 307–337). Greenwich, CT: Information Age Publishing.

Barefoot, J. C. Dodge, K. A., Peterson, B. L., Dahlstrom, W. G., Williams, R. B. (1989). The Cook-Medley Hostility Scale: Item content and ability to predict survival. *Psychosomatic Medicine, 51*, 46-57.

Bartone, P. T., Snook, S. A., Tremble, R. T., Jr., & Trueman, R. (2002). Cognitive and personality predictors of leader performance in West Point cadets . *Military Psychology, 14*, 321-338.

Beckham, J. C. , Roodman, A. A., Barefoot, J. C., Haney, T. L., Helms, M. J., Fairbank, J. A., Hertzberg, M. A., & Kudler, H. S. (1996). Interpersonal and self-reported hostility among combat veterans with and without posttraumatic stress disorder. *Journal of Traumatic Stress, 9*, 335-342.

Bernstein, D. P. et al. (2003). Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse & Neglect, 27*, 169-190.

Blanchard, E. B., Jones-Alexander, J., Buckley, T. C., & Forneris, C. A. (1996). Psychometric properties of the PTSD checklist (PCL). *Behaviour Research and Therapy, 34*, 669-673.

Bray, R. M., Fairbank, J. A., & Marsden, M. E. (1999). Stress and substance use among military women and men. *The American Journal of Drug and Alcohol Abuse, 25*, 239-256.

Breslau, N., Davis, G. C., & Andreski, P. (1995). Risk factors for PTSD-related traumatic events: A prospective analysis. *American Journal of Psychiatry, 152*, 529-535.

Britt, T. W., Adler, A. B., & Bartone, P. T. (2001). Deriving benefits from stressful events: The role of engagement in meaningful work and hardiness. *Journal of Occupational Health Psychology, 6,* 53–63.

Brown, R. L., Leonard, T., Saunders, L. A., & Papsouliotis, O. (1997). A two-item screening test for alcohol and other drug problems. *Journal of Family Practice, 44*, 151-160.

Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh

Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Research, 28*, 193-213.

Cacioppo, S., Frum, C., Asp, E., Weiss, R., Lewis, J. W., & Cacioppo, J. T. (2013). A quantitative meta-analysis of functional imaging studies of social rejection. *Scientific Reports, 3,* 2027. DOI: 10.1038/srep02027.

Cohen, J. (1988). Statistical Power Analysis for the Behavioral Sciences. Mahwah, NJ: Lawrence Erlbaum Associates.

Cohen, S., Doyle, W. J., Skoner, D. P., Rabin, B. S., & Gwaltney, J. M. Jr. (1997). Social ties and susceptibility to the common cold. *Journal of the American Medical Association, 277*, 1940-1944.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24,* 385–396.

Cook, W. W., & Medley, D. M. (1954). Proposed hostility and Pharisaic virtue scales for the MMPI. *Applied Psychology, 38,* 414–418.

Dalal, R. S., Lam, H., Weiss, H. M., Welch, E. R., & Hulin, C. L. (2009). A within-person approach to work behavior and performance: Concurrent and lagged citizenship-counterproductivity associations, and dynamic relationships with affect and overall job performance. *Academy of Management Journal, 52*, 1051-1066.

Davis, M. (1980). A multidimensional approach to individual differences in empathy. JSAS *Catalog of Selected Documents in Psychology*, *10*, p. 85.

Deluga, R. J. (1995). The relation between trust in the supervisor and subordinate organizational citizenship behavior. *Military Psychology, 7*, 1-16.

Diener, E., Emmons, R.A., Larsen, R.J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*, 71-75.

Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D., Oishi, S., & Biswas-Diener, R. (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social Indicators Research, 97*, 143-156.

Driskell, J. E., Hogan, J., Salas, E., & Hoskin, B. (1994). Cognitive and personality predictors of training performance. *Military Psychology, 6*, 31-46.

Ehrhart, M. G., Bliese, P. D., & Thomas, J. L. (2006). Unit-Level OCB and unit effectiveness: Examining the incremental effect of helping behavior. *Human Performance, 19*, 159-173.

Eisenberger, R., & Huntington, R. (1986). Perceived organizational support. *Journal of Applied Psychology, 71*, 500-507.

Eisenberger, R., Fasolo, P., & Davis-LaMastro, V. (1990). Perceived organizational support and employee diligence, commitment, and innovation. *Journal of Applied Psychology, 75*, 51-59.

Estrada, A., Balkin, T. J., Wildzunas, R. M., Rouse, T., & Killgore, W. D. (2009). Sleep and performance measures in soldiers undergoing military relevant training. *Storming Media, Report Number* A578105.

Feder, A., Nestler, E. J., & Charney, D. S. (2009). Psychobiology and molecular genetics of resilience. *Nature Reviews Neuroscience, 10*, 446-457.

Fishbein, M. (1996). Great expectations, or do we ask too much from community-level interventions? *American Journal of Public Health, 86,* 1075-1076. doi: 10.2105/AJPH.86.8_Pt_1.1075

Fiske, S. T., Cuddy, A. J. C., & Glick, P. (2007). Universal dimensions of social cognition: warmth and competence. *Trends in Cognitive Sciences, 11*, 77-83.

Funk, J. L., & Rogge, R. D. (2007). Testing the ruler with Item Response Theory: Increasing precision of measurement for relationship satisfaction with the Couples Satisfaction Index. *Journal of Family Psychology, 21*, 572-583.

Gade, P. A. (2003). Organizational commitment in the military: An overview. *Military Psychology, 15*, 163-166.

Goldberg, L. R. (1992). The development of markers for the Big-five factor structure. *Journal of Personality and Social Psychology, 59*, 1216–1229.

Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr. (2003). A very brief measure of the Big Five personality domains. *Journal of Research in Personality, 37, 504-528.*

Greenberg, N., Langston, V., Fear, N.T., Jones, M., & Wessely, S. (2009). An evaluation of stress education in the Royal Navy. *Occupational Medicine, 59*, 20-24.

Griffith, J. (2002). Multilevel analysis of cohesion's relation to stress, well-being, identification, disintegration, and perceived combat readiness. *Military Psychology, 14Military Psychology, 14*, 217-239.

Hawkley, L. C., Browne, M. W., & Cacioppo, J. T. (2005). How can I connect with thee? Let me count the ways. *Psychological Science, 16*, 798-804.

Hawkley, L. C., Hughes, M. E., Waite, L. J., Masi, C. M., Thisted, R. A., & Cacioppo, J. T. (2008). From social structural factors to perceptions of relationship quality and loneliness: The Chicago Health, Aging, and Social Relations Study. *Journal of Gerontology: Social Sciences, 63B*, S375-S384.

Hawkley, L. C., Preacher, K. J., & Cacioppo, J. T. (2010). Loneliness impairs daytime functioning but not sleep duration. *Health Psychology, 29*, 124-129. PMCID: PMC2841303.

Hays, R. D., Sherbourne, C. D., Mazel, R. M. (1993). The RAND 36-Item Health Survey 1.0. *Health Economics, 2*, 217-227.

Hofmann, S. G., Litz, B. T., & Weathers, F. W. (2003). Social anxiety, depression, and PTSD in Vietnam veterans. *Journal of Anxiety Disorders, 17*, 573-582.

Huffman, A. H., Adler, A. B., Dolan, C. A., & Castro, C. A. (2005). The impact of operations tempo on turnover intentions of Army personnel. *Military Psychology, 17*, 175-202.

Iversen, A. C., Fear, N. T., Ehlers, A., Hacker, H. J., Hull, L., Earnshaw, M., Greenberg, N., Rona, R., Wessely, S. & Hotopf, M. (2008). Risk factors for post-traumatic stress disorder among UK Armed Forces personnel. *Psychological Medicine, 38*, 511-522.

Jones, F. D. (1995). Disorders of frustration and loneliness. In F. D. Jones (Ed.), *War Psychiatry* (pp. 63-83). Washington, DC: Borden Institute.

Kashdan, T. B. (2007). Social anxiety spectrum and diminished positive experiences: Theoretical synthesis and meta-analysis. *Clinical Psychology Review, 27*, 348-365.

King, D. W., King, L. A., & Vogt, D. S. (2003). *Manual for the Deployment Risk and Resilience Inventory (DRRI): A Collection of Measures for Studying Deployment-Related Experiences of Military Veterans*. Boston, MA: National Center for PTSD.

Kobasa, S. (1979). Stressful life events, personality and health: An inquiry into hardiness.

Journal of Personality and Social Psychology, 37, 1-11.
Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*, 606-613.
Kubany, E. S., Denny, N. R., Gino, A., & Torigoe, R. Y. (2006). Relationship of cynical hostility and PTSD among Vietnam veterans. *Journal of Traumatic Stress, 7*, 21-31.
Leary, M.R. (1983). Social anxiousness: The construct and its measurement. *Journal of Personality Assessment, 47*, 66-75.
Lucas, R. E. & Donnellan, M. B. (2012). Estimating the reliability of single-item life satisfaction measures: Results from four national panel studies. *Social Indicators Research*, 105, 323-331.
Mayer, R. C. & Davis, J. H. (1999). The effect of the performance appraisal system on trust for management: A field quasi-experiment. *Journal of Applied Psychology, 84*, 123-136.
Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review, 20*, 709-734.
Meade, A. W., & Craig, S. B. (2012). Identifying careless responses in survey data. Psychological Methods. Advanced Online Publication. doi: 10.1037/a0028085
Meyer, J. P., & Allen, N. J. (1997). *Commitment in the workplace: Theory, research, and application*. Thousand Oaks, CA: Sage.
Oliver, L.W., Harman, J., Hoover, E., Hayes, S. M., & Pandhi, N. A. (1999). A quantitative integration of the military cohesion literature. *Military Psychology, 11,* 57–83.
Peterson, C., & Villanova, P. (1988). An expanded attributional style questionnaire. *Journal of Abnormal Psychology, 97*, 87-89.
Peterson, C., Bishop, M. P., Fletcher, C. W., Kaplan, M. R., Yesko, E. S., Moon, C. H., Smith, J. S., Michaels, C. E., & Michaels, A. J. (2001). Explanatory style as a risk factor for traumatic mishaps. *Cognitive Therapy and Research, 25*, 633-649.
Podsakoff, P. M., & MacKenzie, S. B. (1994). Organizational citizenship behavior and the quantity and quality of work group performance. *Journal of Marketing Research, 31*, 351-363.
Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. (1990). Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *Leadership Quarterly, 1,* 107-142.
Pressman, S. D., Cohen, S., Miller, G. E., Barkin, A., Rabin, B. S., & Treanor, J. J. (2005). Loneliness, social network size, and immune response to influenza vaccination in college freshmen. *Health Psychology, 24*, 297–306.
Rosen, L. N., & Martin, L. (1996). Impact of childhood abuse history on psychological symptoms among male and female soldiers in the U.S. Army. *Child Abuse & Neglect, 20*, 1149-1160.
Rosenberg, M. (1956). Misanthropy and political ideology. *American Sociological Review, 21*, 690-695.
Russell, D. (1996). UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment, 66,* 20–40.
Russell, D., Peplau, L. A., & Cutrona, C. E. (1980). The revised UCLA loneliness scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology, 39,* 472–480.

Russell, J. A., Weiss, A., & Mendelsohn, G. A. (1989). Affect grid: A single-item scale of pleasure and arousal. *Journal of Personality and Social Psychology, 57*, 493-502.

Silvera, D. H., Martinussen, M., & Dahl, T. I. (2001). The Tromso Social Intelligence Scale, a self-report measure of social intelligence. *Scandinavian Journal of Psychology, 42*, 313-319.

Sinclair, R. R. & Tucker, J. S. (2006). Stress-CARE: An integrated model of individual differences in soldier performance under stress. In T. W. Britt, C. A. Castro, & A. B. Adler (Eds.), *Military Life: The Psychology of Serving in Peace and Combat. Vol. 1: Military Performance* (pp. 202-231). Westport, CT: Praeger Security International.

Smith, H. M., & Betz, N. E. (2000). Development and validation of a scale of perceived social self-efficacy. *Journal of Career Assessment, 8*, 283-301.

Solomon, Z., Mikulincer, M., & Hobfol, S. E. (1986). Effects of social support and battle intensity on loneliness and breakdown during combat. *Journal of Personality and Social Psychology, 51*, 1269-1276.

Spitzer, R., Kroenke, K., & Williams, J. (1999). Validation and utility of a self-report version of PRIME-MD: The PHQ Primary Care Study. *Journal of the American Medical Association, 282*, 1737-1744.

Survey Research Center (1969). *1964 Election Study*. Ann Arbor, Michigan: Inter-University Consortium for Political Research, University of Michigan.

Sweeney, P. J., Thompson, V. D., & Blanton, H. (2009). Trust and influence in combat: An interdependence model. *Journal of Applied Social Psychology, 39*, 235-264.

Thomas, J. L., Bliese, P. D., & Jex, S. M. (2005). Interpersonal conflict and organizational commitment: Examining two levels of supervisory support as multilevel moderators. *Journal of Applied Social Psychology, 35*, 2375-2398.

Thompson, E. R. (2007). Development and validation of an internationally reliable short/form of the Positive and Negative Affect Schedule (PANAS). *Journal of Cross-Cultural Psychology, 38*, 227-242.

Trump, D. H. (2006). Self-rated health and health care utilization after military deployments. *Military Medicine, 171*, 662-668.

Turner, J. A., Jensen, M. P., & Romano, J. M. (2000). Do beliefs, coping, and catastrophizing independently predict functioning in patients with chronic pain? *Pain, 85*, 115-125.

Tyyskä, J., Kokko, J., Salonen, M., Koivu, M., & Kyröläinen, H. (2010). Association with physical fitness, serum hormones and sleep during a 15-day military field training. *Journal of Science and Medicine in Sport, 13*, 356-359.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scale. *Journal of Personality and Social Psychology, 54,* 1063-1070.

Weathers, F. W., & Ford, J. (1996). Psychometric properties of the PTSD Checklist (PCL-C, PCL-S, PCL-M, PCL-PR). In B. H. Stamm (Ed.), Measurement of stress, trauma, and adaptation (pp. 250–252). Lutherville, MD: Sidran Press.

Wesensten, N. J., Belenky, G., Balkin, T. J. (2006). Sleep loss: Implications for operational effectiveness and current solutions. In T. W. Britt, C. A. Castro, & A. B. Adler (Eds.), *Military Life: The Psychology of Serving in Peace and Combat. Vol. 1: Military Performance* (pp. 81-107). Westport, CT: Praeger Security International.

Wilk, J. E., Bliese, P. D., Kim, P. Y., Thomas, J. L., McGurk, D., & Hoge, C. W. (2010). Relationship

of combat experiences to alcohol misuse among U.S. soldiers returning from the Iraq war. *Drug and Alcohol Dependence, 108*, 115-121.

Wrightsman, L. S. (1991). Interpersonal trust and attitudes toward human nature. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman, Eds., *Measures of Personality and Social Psychological Attitudes* (pp. 373-412). San Diego, CA: Academic Press.

APPENDIX A

Building Social Resilience in Soldiers:

A Double Dissociative Randomized Controlled Study

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Abstract

Can social resilience be trained? We report results of a double-dissociative randomized controlled study in which 48 Army platoons were randomly assigned to social resilience training (intervention condition) or cultural awareness training (active control group). The same surveys were administered to all platoons at baseline and after the completion of training to determine the short-term training effects, generalization effects beyond training, and possible adverse effects. Multilevel modeling analyses indicated that social resilience, compared to cultural awareness, training produced small but significant improvements in social cognition (e.g., increased empathy, perspective taking, & military hardiness) and decreased loneliness, but no evidence was found for social resilience training to generalize beyond these training foci nor to have adverse effects. Moreover, as predicted, cultural awareness, compared to social resilience, training produced increases in knowledge about and decreases in prejudice toward Afghans. Additional research is warranted to determine the long-term durability, safety, and generalizability of social resilience training.

In the past decade, organizations including the U.S. Military have sought to develop resilience-building programs to reduce mental health and behavioral problems (Cornum, Matthews, & Seligman, 2011). To date, these resilience programs have been associated with small effects (Lester, Harms, Herian, Krasikova, & Beal, 2011; Mulligan, Fear, Jones, Wessely, & Greenberg, 2011; Russell et al., 2014), but even small effects when applied to large numbers of individuals may result in significant economic and societal benefits (Fishbein, 1996; Zatzick, Koepsell, & Rivara, 2009). Whereas the focus in prior research has been on individual resilience, social resilience training may also be relevant to military organizations given the potentially isolating nature of and significant demands associated with combat deployment.

Social resilience refers to the capacity to foster, engage in, and sustain positive relationships, and to endure, recover from, and grow as a result of life stressors and social isolation (Cacioppo, Reis, & Zautra, 2011). Individual resilience emphasizes an individual's capacity to find opportunities in tragedy and to turn adversity to advantage, whereas social resilience emphasizes an individual's capacity to work with others to achieve these endpoints, and consequently the group's capacity to do so, as well. Unlike other forms of personal resilience, social resilience is intrinsically multilevel and includes an individual's characteristic ways of relating and interpersonal capacities (e.g., empathy, perspective taking, trust, hostility, and loneliness) and collective resources and capacities (e.g., organizational trust, perceived group efficacy, and group cohesion and conflict; Cacioppo et al., 2011). Social resilience may be useful in facilitating adaptive response to a significant life stressor or to the loss of relationships such as moving to a new location, a new job, or other times when the individual is at risk for social isolation. Social resilience may also lead to personal growth through enhancing interpersonal relationships, meaning-making, social engagement, and coordinated social

responses to threatening situations.

Social resilience does not imply monolithic pressures toward uniformity nor an uncritically rosy view of the joys of relating. What is unique about social resilience is an appreciation for the key contributions of coordinated social activity and feelings of connectedness to human welfare (Cacioppo, Cacioppo, & Boomsma, 2014; Christakis & Fowler, 2013; Holt-Lunstad, Smith, & Layton, 2010). In other words, when people work together toward their common benefit, taking into account their differences and seeking to profit from them, while recognizing and valuing the bonds that link them to each other, their collective outcomes can transcend those that would be obtained from more solitary activities and promote the development and expression of individual resilience. Of course, other forms of resilience may also strengthen and preserve, but social resilience emphasizes the role of connections with other individuals, groups, and large collectives as a means of fostering adaptation through new learning (including social learning) and growth.

Research on social connections, group processes, and interpersonal relationships suggest that socially resilient individuals are engaged in meaningful social encounters and relationships; that is, feelings of being socially isolated (lonely) are relatively brief or mild. The amount of time spent alone and introversion are not particularly good predictors of loneliness; instead, loneliness is more strongly related to the nature and quality of the interactions and relationship with others (e.g., Hawkley et al., 2008). For instance, individuals who are distant from spouse or friends, who are having marital strain or who experience a loss of a significant relationship, or who do not identify with their group are at risk for feeling socially isolated (Hawkley, Browne, & Cacioppo, 2008). Being ignored or ridiculed also contributes to feelings of isolation (Williams, 2007), whereas the greater people believe they can trust others, the less isolated they tend to feel

over time (Rotenberg et al., 2010), and shared social identities and commitments, such as pride in being a member of and loyalty to a particular group, contribute to lower feelings of isolation (Hawkley et al., 2005). Rather than a discrete categorical state, loneliness is best conceptualized as part of a continuum ranging from salutary social relationships to the perceived absence of any such relationships (for a review, see Cacioppo et al., 2006; Cacioppo & Patrick, 2008).

Numerous studies have documented the serious health consequences of loneliness and social isolation. At one extreme, loneliness is a well established risk factor for suicidal ideation (Stravynski & Boyer, 2001). Lonely people tend to have poor coping mechanisms that, at times, manifest as alcohol abuse (Åkerlind & Hornquist, 1992). Yet, research suggests that loneliness is also an insidious problem. For example, it negatively impacts somatic function while promoting daytime dysfunction (Cacioppo, Hawkley, Berntson et al., 2002) and can increase objective measures of stress, such as a morning rise in cortisol (Adam, Hawkley, Kudielka, & Cacioppo, 2006). Likewise, loneliness can lead to other physical ailments, such as elevated blood pressure (Hawkley, Masi, Berry, & Cacioppo, 2006), increased vascular resistance (Cacioppo, Hawkley, Crawford et al., 2002) and cardiovascular disease (Caspi, Harrington, Moffitt, Milne, & Poulton, 2006). Thus loneliness is an important variable to understand and more importantly, a potential candidate for intervention (Cacioppo & Patrick, 2008)

Similarly, it is important to note that loneliness and depression are related but independent constructs. Prior research has shown that depressive symptomatology, alcohol and substance abuse, and suicide intentions and behavior have a strong social component, and each is exacerbated when people are exposed to significant stress (e.g., Brailey, Vasterling, Proctor, Constans, & Friedman, 2007; Hoge, Auchterlonie, & Milliken, 2006) and when people feel lonely (Cacioppo, Hawkley, & Thisted, 2010; S. Cacioppo et al., 2014; Ong, Fuller-Rowell, &

Bonanno, 2010; Reich, Zautra, & Hall, 2010; Reis, Smith, Tsai, Rodrigues, & Maniaci, 2010; Stanley, Allen, Markman, Rhoades, & Prentice, 2010). , Research has also shown that loneliness and depressive symptomatology are related but separable constructs (e.g., Cacioppo et al., 2006); experimental manipulations of loneliness in humans increases depressive symptomatology (e.g., Cacioppo et al., 2006); naturalistic changes in loneliness from normal life events, as assessed in longitudinal research, influence subsequent levels of depressive symptomatology (Cacioppo et al., 2010) for as long as two years (VanderWeele, Hawkley, Thisted, & Cacioppo, 2011); and experimental manipulations of social loss or separation from a preferred partner in animal research increases depressive behavior (cf. Cacioppo et al., 2015). Thus loneliness can be identified as a valuable target for intervention that can reduce depression as well as other negative health outcomes.

Given the pernicious effects of loneliness, previous studies have examined various interventions to reduce loneliness. These interventions have demonstrated that it is possible to reduce loneliness, and a meta-analysis of these interventions indicated that maladaptive social cognition is a key mechanism for reducing loneliness (Masi, Chen, Hawkley, & Cacioppo et al., 2011). Reducing maladaptive social cognition, such as unrealistic perceptions of others or a preoccupation with self-preservation, was more effective than interventions focused on enhancing social support, and resulted in improved basic social skills and increasing opportunities for social contact (Masi et al., , 2011). At its core, interventions designed to enhance social resilience appear to be best focused on loneliness and the concomitant skills of social cognition.

Social resilience may be a particularly good target in an occupational setting in which social cohesion is explicitly valued as part of the organizational culture and endemic to job

performance. Nowhere is the importance of cohesion more evident than in high-risk occupations such as police, fire fighters and the military in which social cohesion and connectedness are a key part of the occupation's identity and critical for survival (e.g., Adler & Castro, 2013). This is the first randomized controlled study assessing a training program designed to enhance social resilience in a high-risk occupation context.

Given the putative qualities of social resilience (Cacioppo et al., 2011), the evidence that training can reduce loneliness (Masi et al., 2011), and a high-risk occupation that values group cohesion (Griffith, 1988), the goal of the present study was to assess the efficacy of social resilience training developed for the U.S. Army. Consistent with the occupational emphasis of working as a unit, intact groups were randomly assigned to different study conditions (social resilience training and an active comparison training condition).

Efficacy was operationalized with a set of proximal outcomes. First, efficacy was assessed in terms of the extent to which social resilience training, which was focused on social cognition as recommended by Masi and colleagues (2011), actually resulted in improved in social cognition and reduced loneliness. Social cognition included concepts such as increased perspective taking and empathy. Efficacy was also assessed in terms of the degree to which the training resulted in reduced feelings of loneliness and social disconnection, the underlying correlate of many negative health outcomes, and a principal target. Second, training efficacy was assessed in terms of the extent to which social resilience training enhanced positive work group attitudes such as increased platoon cohesion, collective platoon efficacy, and lower platoon conflict. The training, provided to existing small groups (platoons), was designed to increase the platoon's understanding of the relevance of social connection to their own functioning. These outcomes were primary objectives of the training; all three outcomes were

expected to improve in the social resilience training condition relative to the comparison training condition.

The degree to which the active comparison training, which was focused on cultural awareness, actually resulted in greater cultural awareness was also assessed. This assessment addressed the degree to which cultural awareness training resulted in proximal changes in cultural awareness attitudes. While not the focus of social resilience, it was important to test for the efficacy of cultural awareness training in order to demonstrate that social resilience training did not simply result in improvements across the board due to over-arching demand characteristic or the Hawthorne effect. Furthermore, studies have identified the importance of cultural competence in the military (Abbe & Gouge, 2012) and the potential for training to positively affect cross-cultural attitudes (Caligiuri, Noe, Nolan, Ryan & Drasgow, 2011; Gabrenya, Griffith, Moukarzel, Pomerance & Reid, 2012; Rehg, Gundlach, & Grigorian, 2012).

Another objective was to investigate the impact of training on relatively distal outcomes associated with social connection and work attitudes beyond the platoon. Thus, training was assessed in terms of how the intervention generalized to soldier perceptions of other personal relationships (e.g., satisfaction with relationships with family and friends) and the Army as a whole (e.g., organizational commitment, perceived organizational support). In addition, given the link between loneliness and mental health, the distal outcome of mental health was included in the assessment of training efficacy. Specifically, the training was assessed in terms of whether there were immediate improvements in mental health, operationalized as lower depressive symptomatology. If evidence is found that training can enhance social resilience, subsequent research can address the long-term impact of resilience training in high-risk occupational groups.

Even if an intervention has a positive mean effect, it is possible that the training is not

effective or perhaps is even harmful to specific subgroups of individuals (Eidelson & Soldz, 2012). Therefore, we also investigated potential beneficial or adverse effects of the social resilience training on the health and wellbeing of soldiers. For instance, ancillary analyses were performed on data from soldiers to assess the extent to which the effects of social resilience training varied as a function of dispositional (e.g., openness, conscientiousness) and situational factors (e.g., combat experience). Both dispositional and situation factors have been found to impact resilience outcomes in previous research (e.g., Hoge, Austin, & Pollack (2007); Adler et al., 2009).

Methods

Design and Participants

The study was a double-dissociative randomized controlled study design in which platoons were randomly assigned to receive either Social Resilience Training (SRT) to improve maladaptive social cognition and loneliness (intervention condition) or Afghanistan Cultural Awareness Training (CAT) to improve understanding of and reduce prejudice toward Afghans (active control condition). Both were characterized as "Social Awareness and Action Training" with the goal of increasing "social fitness." The intervention condition was hypothesized to improve maladaptive social cognition, loneliness, and work group attitudes while having no effect on knowledge of or outgroup bias toward Afghans; whereas the active control condition was hypothesized to increase knowledge of and decrease outgroup bias toward Afghans while having no effect on maladaptive social cognition, loneliness, or work group attitudes.

The double-dissociative aspect of the randomized clinical design comes from neuropsychology where one region of the brain (or a lesion in one region of the brain) is shown to influence a self-report or performance on a task that involves behavioral process "A" rather

than “B,” and a different region of the brain (or lesion in this region of the brain) is shown to influence a self-report or performance on a task that involves behavioral process “B” rather than “A.” This double dissociation makes it possible to distinguish general versus specific effects of an activation (or lesion) of a region of the brain (see Bechara et al., 1995, for an example in neuroscience and Adler et al., in press, for an example in organizational psychology), although there are disadvantages in neuroscience associated with modularity or independence of effect (van Orden, Pennington, & Stone (2001). In the present context, however, the expectations were that the trainings would have different targets: (a) the social resilience training (the intervention condition) was hypothesized to improve *specific* aspects of social resilience such as decreased levels of loneliness and hostility and increased levels of empathy, perspective taking, military hardiness, and social skills practice but to have no effect on the rated competence or warmth of Afghans; and (b) the education and cultural awareness training (the active control condition) was hypothesized to increase the rated competence and warmth of Afghans (and, consequently, to lower outgroup prejudice) but to have no effect on the measures of social resilience. Thus, the “double dissociative” randomized controlled study means the two types of training are hypothesized to have *unique, specific, and directional consequences*, whereas the operation of any general bias, such as demand characteristics, placebo effects, expectancy effects, or Hawthorne effects, should have similarly putatively beneficial effects on the measures of social resilience *and* the ratings of the competence and warmth of Afghans. As a result of the directional nature of these experimental hypotheses one-tailed tests were specified.

The between-subjects factors were a series of hierarchical organizational command structures labeled Brigade (very large organizations, ~3000 soldiers), Battalion (~700 soldiers), Company (~100 soldiers), Platoon (~30 soldiers), and experimental Condition (SRT or CAT),

and the within-subjects factor was Measure (within Variable Set) and Time (Pretest, Posttest). Platoons were randomly assigned to receive either an eight-hour SRT program (intervention condition) or an eight-hour CAT program (active control condition). Participants completed surveys immediately before the first training session (pretest, Time 1) and immediately after the last training session (posttest, Time 2).

The sample size was estimated based on an expected effect size of d = .15, and plans were made to recruit soldiers from two brigades at two large Army posts in the US. Despite the plan to include a total of 64 platoons from the two brigades, 16 platoons from one brigade deployed to combat just prior to the start of the study. To mitigate the effects of the smaller number of platoons (and soldiers) on statistical power, platoons were randomly assigned to the two arms of the training with the constraint that approximately 60% of the platoons were assigned to the social resilience arm of the intervention. This oversampling of the intervention arm was done to provide greater statistical power in ancillary analyses to determine the extent to which the SRT was differentially helpful for subgroups of soldiers.

Soldiers were from two maneuver brigades located on two different large Army posts. The brigades were from the full-time Active Duty component of the Army (rather than part-time Army units, such as the National Guard and Army Reserves). While there was no specific expectation regarding an upcoming deployment, these were operational brigades subject to constant preparation for deployment to combat zones (rather than training units designed for individual skill attainment that are not subject to deployment). On average, the soldiers were 24 years old (ranging from 18 to 42), and had served in the Army for 4.5 years (ranging from 1 and 24 years, with 90% of the Soldiers having served 10 years or less); 76% had deployed previously to combat. In terms of rank, 78% were junior enlisted, 19% were non-commissioned officers,

and 3% were officers.

Procedure

The study procedure was reviewed and approved by the University of Chicago Institutional Review Board and by the U.S. Army Medical Research and Materiel Command Human Research Protection Office. Both training programs were developed in collaboration with research psychologists in the U.S. Army and through focus groups and pilot studies with soldiers at three U.S. Army posts over an 18-month period. Soldiers consented as to whether or not they wanted to be in the study. The rate of consent was 93.7%, which is comparable to the consent rate reported in previous research on Army soldiers (e.g., Wilk et al., 2010).

Allocation Strategy

Of the 48 platoons, 29 platoons consisting of 688 soldiers were randomly assigned to SRT and 19 platoons consisting of 450 soldiers were randomly assigned to CAT. In the SRT condition, 489 soldiers (71.1%) completed a one-hour pretest, and the data from 10 of these soldiers were not included in the analyses based on exclusionary criteria (see below). In the CAT condition, 328 soldiers (72.8%) completed the pretest, and the data from 6 of these soldiers were not included in the analyses based on exclusionary criteria. The number of participants at each measurement occasion and the reasons for attrition are shown in Figure 1, and the demographic data on the sample at each measurement occasion are summarized in Table 1.

Measures

To minimize Type 1 error rate, outcome measures were identified and organized within Variable Sets, and the experimental hypotheses were tested at the level of Variable Set within our multi-level data analysis. Specifically, for each Variable Set, a fixed effect of the Measure variable was added to the model to account for the use of multiple measures within each Variable

Set. Univariate tests to examine the specific effects of the training are interpreted only when the tests of the corresponding aggregate measure reaches statistical significance, but the results and effect size for all measures are provided in tables to support future research endeavors and meta-analyses. Given that the primary goal of grouping by variable set was to reduce Type I error, the groupings themselves are constructed relatively broadly.

Measures were identified to assess the effects of social resilience versus cultural awareness training on how soldiers (a) reported greater social cognition and overall sense of social connection (*social cognition*; Variable Set 1), (b) perceived their platoon as a more positive entity (*work group attitudes*; Variable Set 2), (c) knew more about Afghans and Afghanistan and felt less outgroup prejudice toward Afghans (*cultural awareness & outgroup prejudice*; Variable Set 3), (d) perceived people and organizations beyond the platoon more positively (*training generalization*; Variable Set 4), and (e) were doing better or worse in terms of measures of health and wellbeing (*health and wellbeing*; Variable Set 5). The measures were clustered within Variable Sets *a priori* on theoretical grounds, and two experts reviewed the variable sets. There was agreement on all but one measure, and the issue was resolved through discussion. After the Variable Sets were defined, a confirmatory factor analysis was conducted, and the results confirmed the grouping of these variable sets was reasonable. [1]

Surveys were administered before and after training. The survey data were de-identified along with the soldiers' consent information. Some of our outcome measures were adapted when the original instructions referred to the *last two weeks*. Since the pretest (Time 1) and posttest (Time 2) were conducted a work-week apart (Monday and Friday, respectively), these instructions were consistently changed to the *last week* in the posttest. A list of the outcome measures collected at the pretest and posttest; the moderator variables collected at pretest,

posttest, or through an Army database; and a detailed description of each measure is provided in Supplementary Materials_Measures. These measures are described briefly below. Where appropriate, reverse scoring of scale items was performed prior to the calculation of the scale score. Unless specified otherwise, responses were given on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) and averaged to yield a total score (e.g., from 1 [low] to 5 [high]).

Social Cognition (Variable Set 1). Outcome measures were developed to evaluate the effectiveness of SRT and to determine the unique effects of SRT relative to CAT. The concepts in this variable set primarily encompassed variables reflecting individuals rating their attitudes toward social connection with others and their experience of that social connection (i.e. improved in social cognition and reduced loneliness). This variable set cast a relatively wide net but is characterized by proximal social resilience outcomes targeted by the training. The specific measures of how soldiers thought about others and felt about themselves in relation to others (i.e., social cognition; in alphabetical order) were as follows: (A) *Beliefs about Social Fitness* were assessed with three items, such as "I believe that social skills can be improved through practice." (B) *Empathy* was assessed using four items from the Empathic Concern subscale of the Interpersonal Reactivity Index developed by Davis (1980). (C) *Generalized Trust* in people was assessed using the first three items from Rosenberg's Faith in People Scale (Rosenberg, 1956) to assess generalized trust. (D) *Hostility* was assessed using a 9-item version (Barefoot et al., 1989) of the Cook–Medley Hostility Scale (CMHo; (Cook & Medley, 1954). (E) *Loneliness* was measured using the 9-item short version (Hawkley et al., 2005) of the Revised UCLA scale (Russell, 1996). (F) *Military Hardiness* was assessed with items drawn from a scale developed by Dolan and Adler (2006) to assess a person's commitment to and involvement in

daily life, feelings of control of the events of one's life, and the extent to which change, and the anticipation of change, was perceived as an exciting opportunity for personal growth. (G) *Perceived Social Fitness* refers to the *confidence* people have to be able to perform various social fitness behaviors. The scale consisted of 15 social fitness skills that were adapted from the UCLA-R scale, the Social Intelligence Scale (Silvera, Martinussen, & Dahl, 2001), and the Perceived Social Self-Efficacy Scale (Smith & Betz, 2000). (H) *Perspective Taking* was assessed with four items from the perspective taking subscale of the Interpersonal Reactivity Index developed by Davis (1980). (I) *Practiced Social Skills* was assessed by asking soldiers to indicate how often they had shown 7 different behaviors in the past week by selecting one of the following response options: 0 (never), 1 (once), 2 (2-3 times), 3 (4 times or more).

Work Group Attitudes (Variable Set 2). The measures of how soldiers perceived their platoon (i.e., work group attitudes; in alphabetical order) were as follows: (A) *Collective Platoon Efficacy* was assessed by adapting five items from the family efficacy scale (Bandura, 2006). (B) *Counterproductive Work Behaviors* (CWBs) were assessed at the platoon-level with a 6-item scale used by Dalal et al. (2009). (C) *Organizational (Platoon) Trust* was assessed using 5 items that are military adaptations by Sweeney, Thompson, and Blanton (2009) of organizational trust scales (Mayer & Davis, 1999). (D) *Organizational (Platoon) Citizenship Behaviors* (OCBs) were assessed by adapting five items from the military version (Deluga, 1995) of the 24-item OCB scale by Podsakoff, MacKenzie, Moorman, and Fetter (1990). (E) *Platoon Cohesion and Support* was assessed using items from a 3-item cohesion scale adapted from Podsakoff & MacKenzie (1994) for a military sample and four items from Griffith (2002) to assess emotional support from leaders and emotional support from fellow soldiers. (F) *Platoon Conflict* was measured with a 4-item scale used in research with military samples (Spector & Jex, 1998). (G)

Satisfaction with Relationships in the Platoon was assessed with 2 items: "On average, how well do you know the people in your platoon?" and "On average, how satisfied are you with your relationships with people in your platoon?" (H) *Treatment of Weakest Link* was assessed by asking soldiers to rate the extent to which they agreed with the statements, “It is right for a platoon to socially isolate its poorly performing members,” and “It is right for a platoon to commit time to help its poorly performing members.” Higher score means better treatment of the weakest link.

Afghanistan Cultural Awareness and Outgroup Prejudice (Variable Set 3). Measures were also developed to evaluate the effectiveness of CAT and to determine the unique effects of CAT versus SRT. The specific measures of what soldiers knew about Afghanistan and how they felt and thought about Afghans and Americans (i.e., outgroup knowledge and prejudice; in alphabetical order) were as follows: (A) *Competence and Warmth of Afghans* was measured by asking soldiers to rate the warmth and competence of the Afghan people (Fiske, Cuddy, & Glick, 2007) using adapted items from Collange, Fiske, and Sanitioso (2009). (B) *Competence and Warmth of Americans* was measured using the same items as that was used for the Afghan people. (C) *Knowledge about Afghanistan / Cultural Awareness* was assessed using 5 multiple-choice items covering different aspects of Afghans culture, economy, and religion that were taught soldiers in the CAT Condition. (D) *Outgroup Prejudice* was defined as the mean score for perceived warmth of Americans minus the mean score for perceived warmth of Afghans to yield a score that reflected prejudice toward the outgroup (Afghans). A comparable difference score was calculated for perceived competence. Lower ratings of Afghans relative to American people signifies greater outgroup prejudice on the dimensions of warmth and/or competence (Collange et al., 2009).

Potential Resilience Training Generalization (Variable Set 4). Measures were developed to evaluate the possible effects of SRT beyond the platoon in terms of perceptions of friends, family, and the U.S. Army. The measures (i.e., training generalization effects; in alphabetical order) were as follows: (A) *Malingering Beliefs* were assessed by two items, "It is acceptable to seek medical care in order to avoid duties that are difficult, unpleasant, or dangerous," and "It is acceptable to go on sick call for minor medical problems that I could handle myself." (B) *Perceived Organizational Support* was measured using 3 items from the Perceived Organizational Support scale (Eisenberger & Huntington, 1986). (C) *Organizational Commitment* was defined as an affective commitment to or identification with the military service or unit and was assessed with four items from Allen & Meyer (1990). (D) *Satisfaction with Personal Relationships* with children, parents, friends, and relatives were assessed with 1 item for each relationship domain (i.e., "On average, how satisfied are you in your relationship with…").

Potential Adverse Effects of Resilience Training on Health and Wellbeing (Variable Set 5). The measures of potential adverse effects on health and wellbeing of soldiers (i.e., health and wellbeing; in alphabetical order) were as follows: (A) *Alcohol Misuse* was assessed using the Two-Item Conjoint Screen (TICS; Brown, et al., 1997). Response options were yes or no, and the number of affirmative responses was summed for a scale score ranging from 0 (low) to 2 (high). (B) *Anxiety* was measured using three items from the Interaction Anxiousness Scale (Leary, 1983). (C) *Catastrophizing*, the tendency to explain bad events in a pessimistic way, was assessed with four items drawn from the Attributional Styles Questionnaire (Peterson & Villanova, 1988). (D) *Depressive Symptoms* were assessed using the 9-item depression scale of the Patient Health Questionnaire (PHQ-9; Spitzer, Kroenke, & Williams, 1999). (E) *Life*

Satisfaction was assessed with an item used by Lucas and Donnellan (2012). (F) *Mood* in the past week of work was assessed with the following item: "On average, how would you describe your mood in the last work week?" (G) *Perceived Stress* was measured using the 4-item Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983). (H) *Sleep Quality* was assessed by asking a single question taken from the Pittsburgh Sleep Quality Index (Buysse et al., 1989): "During the past work week, how would you rate your sleep quality overall?" (I) *Vitality* was assessed using four items from the RAND version of the SF-36 (Hays, Sherbourne, & Mazel, 1993).

Moderator Variables. Ancillary analyses were also performed to investigate whether the beneficial or adverse effects of the training varied based on situational or dispositional factors. The Army database was used to secure *demographic data* (age, gender,[2] education, rank [noncommissioned officer, NCO, or enlisted soldier]). Additional information regarding *social relationships* (marital/partner status, number of children, number of friends, number of close relatives, and whether or not they have a religious affiliation) was obtained in the pretest survey. The remaining moderator variables (in alphabetical order) were as follows (see Supplementary Materials_Measures for details): (A) *Childhood Trauma* was assessed at pretest using an eight item version of the Childhood Trauma Questionnaire (Bernstein et al., 2003). (B) *Combat Experiences* were measured in the posttest using 29 items from the Combat Experiences Scale (CES) to obtain a global assessment of combat exposure. For each of the six categories, soldiers were asked to endorse (Yes/No) all the experiences that applied. "Yes" responses are summed to generate a scale score that ranged from 0 (low) to 29 (high). (C) *Leadership Quality* was assessed using a 10-item version of the Multidimensional Leadership Quality scale (MLQ; Avolio & Bass, 2009). Items were rated on a 5-point scale from 0 (not at all) to 4 (always)

regarding frequency with which soldiers observed their first line supervisor display each behavior. (D) *(Negative) Leadership Behavior* was measured by having soldiers rate their first line supervisor on three negative leadership behaviors drawn from McGurk, Sinclair, Thomas, Merrill, and Bliese (in press) that asks, for example, how often "your supervisor embarrasses platoon members in front of other platoon members." (E) *Big 5 Personality Traits* of extraversion, agreeableness, conscientiousness, openness, and neuroticism (Goldberg, 1992) were measured using an abbreviated 10-item scale (Gosling, Rentfrow, & Swann, 2003). (F) *Platoon Type* was designated as falling within one of two broad categories (combat or combat support) based on their main function/specialty. Combat platoons included Infantry, Artillery, and Cavalry units; whereas combat support platoons included Headquarters, Medical, and other support units. (F) *Previous Deployment* was assessed in the pretest by asking soldiers how many times they had deployed to a combat zone. Approximately 75 percent of the soldiers were previously deployed, the data were highly skewed, and as such this measure was treated as a dichotomous variable (N/Y) in the moderator analyses.

Intervention

Each platoon was assigned for two-hour training blocks per day for each of five consecutive days. Each two-hour block was divided into two 50-min training sessions separated by a 10 min break, with the exception that the first 50-min session was spent completing a pretest survey (T1) and the final 50-min session was spent completing the posttest survey (T2). Trainers were randomly assigned and taught the full 8-hour block. The primary mode of delivery for both the training sessions was verbal instruction delivered by the trainer and accompanied by a PowerPoint session.

Social Resilience Training (Intervention Condition). SRT was designed to address

feelings of isolation and maladaptive social cognition, with an emphasis on modifying maladaptive social cognitions and motivating soldiers to practice the new perspectives and skills that were taught (Cacioppo et al., 2011; Masi et al., 2011). In addition, Squad leaders assisted trainers in guiding soldiers through the exercise in small groups and in the platoon as a whole. The soldiers were encouraged to collaboratively contribute answers. Written reflection activities included small group collaborations and were shared with the group. The training manual for the SRT intervention is provided in Supplementary Materials_SF Trainer's Guide.

SRT consisted of eight training sessions. Session 1 (Survival Skills) introduced social fitness, its relevance and benefits to overall soldier fitness, and its comparability to physical fitness in terms of its malleability. Session 2 (Mind-Reading) was devoted to descriptions and demonstrations of the variety of ways people obtain information about others through non-verbal means (e.g., reading facial expressions, tone of voice), and how to avoid falling into the trap of behavioral confirmation and self-fulfilling prophecy when interpreting non-verbal signals (e.g., verify rather than assume one knows what the other is thinking or feeling). Session 3 (Learning to Connect at a Distance) sensitized soldiers to "mirror processes" (automatic processes such as mimicry, reciprocity) and how they contribute to social contagion, and taught skills and values required to consider one's own interests within the context of concern for others and for the platoon. Session 4 (Expanding Unit Cohesion) focused on identifying and developing platoon identity; transmitting the unit's norms to new soldiers; and benefiting from diversity along multiple dimensions including opinions, beliefs, and capacities to improve unit performance and decision-making.

Session 5 (Building Social Resilience) taught how to benefit from and productively share negative and positive experiences with others in the unit, and the importance of role flexibility in

accommodating changing needs within the unit. Session 6 (Dealing With Your and Others' Feelings of Isolation) focused on the importance of recognizing and coping with the pain of social isolation, and taught specific skills soldiers could use to prevent social pain from spreading, including good communication skills (listening and speaking) along with the use of perspective-taking accompanied by verification of social assumptions and inferences. Session 7 (Conflict Resolution) defined conflict and its effect on interpersonal relationships and group performance, taught how to address conflict constructively, to de-escalate conflict, to avoid blaming others, and to take advantage of the skills among unit members to resolve conflicts. The eighth (capstone) session required the soldiers to apply what they had learned in the training. The trainer presented socially challenging scenarios that required soldiers to draw on the skills and principles they had learned to devise strategies to minimize negative effects and optimize soldier and unit wellbeing and performance.

Afghanistan Cultural Awareness Training (Active Control Condition). The CAT was designed to reduce social prejudice toward Afghans in part by increasing their knowledge about the population, culture, history, geography, and diversity of Afghanistan. Unlike SRT, the CAT did not include any group activities but focused on individual rather than collective learning. The soldiers were encouraged to individually contribute answers rather than collaborate. All the written reflection activities were done on an individual basis and were not shared with the group. CAT also consisted of eight training session (Cultural Awareness & Geography; History; Religion; Ethic Groups & Social Customs; Economy & Politics; Recreation; Food, Dress, Health, & Education; and Capstone). The training manual for the CAT intervention is provided in Supplementary Materials_CA Trainer's Guide.

Training of Trainers and Treatment Adherence

Trainers were nine former Army noncommissioned officers with extensive military instruction experience. All trainers had prior experience with Army training doctrine that requires strict adherence to a Program of Instruction. The train-the-trainer program lasted 3 weeks. During the first week trainers received training in how to conduct both the SRT and the CAT. Trainers were (and remained) blind to the experimental hypotheses. During the second and third week, trainers studied, rehearsed and practiced both training packages. The trainers presented the training sessions to their fellow trainers to practice their delivery, be critiqued and receive feedback from their peers. During the final week of training, each trainer was evaluated individually and critiqued by the project leader and research team to ensure adherence to the training material. Based on these evaluations, the eight best trainers were selected to conduct both the SRT and the CAT programs.

Training sessions were digitally recorded, and two judges rated the adherence of each trainer to the training manual for each session on a 3-point scale (1 = material not covered, 2 = material covered partly or poorly, 3 = material covered well). The mean of these scores across topics within a session constituted a measure of *Overall Training Adherence*. In addition, judges rated each training session in terms of "pacing and efficient use of time," "teaching effectiveness (organized)," and "interpersonal effectiveness (engaging/motivational)," using a 3-point scale (1 = poor, 2 = good, 3 = excellent), and the mean of these scores served as the measure of *Overall Session Quality*. Analyses of the measures of treatment adherence confirmed that trainers were uniformly high in terms of treatment adherence (M_{SRT} = 2.65, SD = 0.38; M_{CAT} = 2.65, SD = 0.41, t (200) = 0.07, n.s.) and overall session quality (M_{SRT} = 2.50, SD = 0.45; M_{CAT} = 2.48, SD = 0.43, t (192) = 0.41, n.s.).

Data Preparation

To identify careless responding, three instructed response items were presented at different places in the survey. The general format of these items was: “To help us monitor the quality of the data you’re giving us, please select the option [the “correct” option is requested]…” Meade and Craig (2012) have shown that instructed response items are a valid and economic tool to detect careless responding. To ensure data quality, three exclusionary criteria were applied to the obtained responses: (a) all three responses to the Instructed Response Items were answered incorrectly, (b) evidence of straight-line responding was observed on more than 75% of the scales with reverse worded items, or (c) two of the three responses to the Instructed Response Items were answered incorrectly and evidence of straight-line responding was observed on at least 40% of the scales with reverse worded items. As noted in Figure 1, data from 20 soldiers on the pretest or posttest (11 from the SRT, 9 from the CAT) were judged to be of questionable validity based on these criteria and were not included in analyses. Additionally, outliers were handled in accordance with Tabachnick and Fidell (2007).

Although platoons were randomly assigned to condition, we performed preliminary analyses to investigate possible differences in the pretest between participants in the SRT and CAT conditions. We employed a two-step procedure: In Step 1, we examined the correlations between group membership and all variables examined in this study. For each association, we selected the correlation coefficient that is most appropriate for this combination of variables: the point-biserial correlation for a binary and a continuous variable, and Cramér's *V* (Cramér, 1946) for a binary and a categorical variable. In Step 2, we selected those variables that were significantly associated with group membership and performed a logistic regression analysis with group membership as the outcome to identify the most relevant predictors of baseline differences. These variables were then included as covariates in the central model. Two baseline

measures were found to differ between the two conditions: combat experience and empathy. Therefore, these measures served as covariates in the multilevel models. Results were the same when the analyses were performed without including covariates.

Finally, we examined the number of training sessions attended and soldier satisfaction ratings. Soldiers in the SRT condition attended slightly but significantly more sessions (M_{SRT} = 7.41, SD = 1.30) than soldiers in the CAT condition (M_{CAT} = 7.15, SD = 1.60, $t(577) = 2.16$, $p < .05$). Analyses of the percent of soldiers who attended all of the training sessions indicated an equally high percentage in both conditions (78.5% in SRT, 71.9% in CAT, $X^2(1) = 3.29$, n.s.). To determine whether differences between Conditions existed in the soldier's satisfaction with the training, we assessed satisfaction with the training in the posttest using the item "Overall, how satisfied are you with the SAAT training?" Responses are given on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*). Analyses confirmed that the soldiers were generally satisfied with the training and that there were no differences between Conditions (M_{SRT} = 3.84, SD = 1.14; M_{CAT} = 3.72, SD = 1.12, $t(570) = 1.23$, n.s.).

Data Analytic Plan

To account for the multi-level structure of the data, the data were analyzed with multilevel models with Time on Level 1, Individuals on Level 2, Platoons on Level 3, Companies on Level 4, Battalions on Level 5.[3] R was used for the analyses (R Development Core Team, 2011). The lme4 package (Bates & Maechler, 2010) was used to estimate the multilevel models, the lmerTest package (Kuznetsova, 2012) was used to estimate the corresponding *p* values based on Satterthwaite's approximation for the degree of freedom.

For each outcome, the first model we checked was an empty model without any predictors. This model allowed us to estimate the proportion of variance accounted for by each

level using intraclass correlation coefficients (ICCs) for each dependent variable. The results are summarized in Supplementary Materials_ICC. The results across all measures showed ICCs in the double digits for Level 1 (Md = .35) and Level 2 (Md = .61), and much smaller ICCs for Level 3 (Md = .03), Level 4 (Md = .00), and Level 5 (Md = .00). The ICCs for Levels 3-5 were in the single digits except for the measures in Variable Set 3 (i.e., targets of CAT), where the ICCs ranged from 0 to .20 (Md = .03). The analyses of these measures were not meaningfully altered by the exclusion of the higher order levels, but we retained these in the multilevel model in keeping with the data structure.

The effect size for each Variable Set and for each dependent variable was determined based on calculations of the standard deviation from the individual level variance reported in the multilevel model output (Schagen & Elliot, 2004). The effect size was calculated by dividing the multilevel model regression coefficient by the standard deviation at the individual level. To simplify the presentation of the Time x Condition interaction results, we coded each effect size so that a positive effect size reflects a larger improvement in the SRT condition than in the CAT condition. The directional experimental hypotheses in this double-dissociative randomized controlled study are that the effect sizes would be positive for the variable sets for social cognition (Variable Set #1) and work group attitudes (Variable Set #2) but negative for the variable set for Afghanistan knowledge and outgroup bias (Variable Set #3). The tests of the remaining variable sets are two-tailed, as the predictions are not directional. If there are beneficial effects of SRT, relative to CAT, on perceptions of family, friends, and the U.S. Army, then the effect size should be positive for the variable set for training generalization effects (Variable Set #4), and if there are adverse effects of SRT, relative to CAT, then the effect size should be negative for the variable set for health and wellbeing (Variable Set #5). Finally, we

performed ancillary moderator analyses to explore whether training effectiveness or adverse effects varied across subgroups that differ by disposition or circumstance (situation).

Results

Test of Experimental Hypotheses

We first examined the effects of the SRT condition on the soldiers' feelings of isolation and social cognition (Variable Set 1). If SRT was effective, the Time x Condition interaction should show that soldiers in the SRT condition reported greater (pretest to posttest) improvement on these outcomes than soldiers in the CAT condition. Results revealed the predicted Time x Condition interaction, $\beta = 0.13$, SE = 0.07, $t(9848) = 1.80$, $p = .04$ (one-tailed) with an overall effect size of +0.21 (see Figure 2).

Univariate analyses and effect sizes for measures in the social cognition variable set are summarized in Table 2. The Time x Condition interaction reached statistical significance and showed greater improvements on six of nine measures: belief in social fitness, $\beta = 0.12$, SE = 0.06, $t(579) = 2.05$; empathy, $\beta = 0.11$, SE = 0.05, $t(1154) = 2.08$; military hardiness, $\beta = 0.12$, SE = 0.05, $t(578) = 2.45$; perceived social isolation (loneliness), $\beta = -0.54$, SE = 0.31, $t(570) = -1.74$; perspective taking, $\beta = 0.10$, SE = 0.05, $t(579) = 1.80$; and showing social skills, $\beta = 0.13$, SE = 0.05, $t(578) = 3.05$ (see Table 2).

We next analyzed the effects of the SRT condition on work group attitudes (Variable Set 2). Results revealed the Time x Condition interaction was not significant, $\beta = 0.03$, SE = 0.03, $t(8684) = 0.997$, with an overall effect size of +0.07 (see Figure 2). Univariate analyses and effect sizes are summarized in Table 2.

If the interventions had specific rather than general effects, the Time x Condition interaction should show that soldiers in the SRT condition reported *less* (pretest to posttest)

improvement on the measures of how soldiers felt about Afghans and knew about Afghanistan (Variable Set 3) than soldiers in the CAT condition. Results revealed the predicted Time x Condition interaction, β = -0.51, SE = 0.05, $t(5147) = -9.93$, $p = .0001$ with an overall effect size of -1.52 (see Figure 2).

Univariate analyses and effect sizes are summarized in Table 2. The Time x Condition interaction reached statistical significance and, as predicted based on training content, showed greater improvements in the CAT than SRT conditions on two of the five measures: knowledge about Afghanistan, β = -1.63, SE = 0.11, $t(579) = -14.46$; and perceived warmth of Afghans, β = -0.67, SE = 0.08, $t(564) = -8.43$ (see Table 2). Analyses of the derived measures to assess outgroup prejudice also revealed the predicted improvements in CAT, relative to SRT, conditions on one of the two measures of outgroup prejudice: perceived difference in warmth (US-Afghans), β = 0.61, SE = 0.10, $t(563) = 5.83$ (see Table 2).

Potential Training Generalization Effects

An ancillary aim was to test the notion that building social resilience would generalize to how soldiers related to their family and friends as well as the U.S. Army (Variable Set 4). Results revealed the overall Time x Condition interaction was not significant, β = 0.02, SE = 0.05, $t(4009) = 0.39$, with an overall effect size of .02 (see Figure 3). Univariate analyses and effect sizes are summarized in Table 2.

Potential Adverse Effects

To investigate potential adverse effects of resilience training programs, we analyzed measures of health and wellbeing (Variable Set 5). Results revealed the Time x Condition interaction was not significant, β = 0.05, SE = 0.04, $t(9720) = 1.33$, with an overall effect size of +0.07 (see Figure 3). Univariate analyses and effect sizes are summarized in Table 2.

Ancillary Moderator Analyses

The full exploratory moderator analyses[4] are reported in Supplementary_Materials_Moderators. The results suggested possible situational and dispositional factors that are associated with better outcomes from social resilience training. For instance, significant Group x Time x Moderator interactions indicated that soldiers who had not been previously deployed and those high in conscientiousness, agreeableness, or openness showed evidence of benefitting more from SRT than their counterparts, whereas these moderators had no effect on the efficacy of CAT (see online Supplementary_Materials_Moderator).

In addition, as summarized in the online supplementary materials on moderator analyses, depressive symptomatology was involved in two significant interactions involving a moderator, both of which suggested resilience training was beneficial: (1) depressive symptomatology decreased following SRT in soldiers who did not attend religious services but did not change in in soldiers who attend religious services; and (2) depressive symptomatology decreased more following SRT in soldiers who reported a history of childhood trauma than in soldiers who did not. For soldiers in the CAT condition, neither moderator was related to the change in depressive symptomatology following training.

Moreover, personality moderated the effects of SRT but not CAT, with soldiers in the SRT condition who were high in: (a) *openness* showing greater decreases in loneliness, larger increases in organizational citizenship behavior, and larger increases in platoon relationship satisfaction; (b) *conscientiousness* showing greater decreases in loneliness, and larger increases in organizational citizenship behavior; and (c) *agreeableness* showing larger increases in perceived social fitness, larger increases in platoon relationship satisfaction, and, paradoxically,

larger increases in malingering beliefs (see Supplementary_Materials_Moderators). Given the exploratory nature of these analyses, results should be interpreted cautiously.

Discussion

Resilience building training programs have been adopted by the U.S. Army and have been associated with small but measurable benefits. Among the criticisms raised about these efforts are failing to control for confounding variables, account for the hierarchical structure of the data, test the applicability of the resilience training programs for soldiers prior to widespread implementation, attend to potential adverse effects of resilience training programs for soldiers (or subgroups of soldiers), and control for biases in self-report data such as placebo effects and demand characteristics (Eidelson & Soldz, 2012). The design of the present study addresses these criticisms while evaluating an intervention developed specifically for the U.S. Army to improve social resilience.

Results indicated that the SRT and the CAT each produced significant improvements, relative to the other, in the *specific* domain in which the platoons were trained. Soldiers in the CAT, compared to SRT, showed significant improvements in their perceptions of Afghans, and follow-up analyses indicated that the changes most evident by the end of training were found for the soldiers' knowledge of Afghanistan, the perceived warmth of Afghans and, consequently, reductions in the perceived differences in warmth between Americans and Afghans (i.e., reduced outgroup prejudice). On the other hand, soldiers in the SRT, compared to CAT, showed an overall improvement in social cognition, with follow-up analyses indicating that the SRT condition increased empathy, perspective taking, military hardiness, beliefs in social fitness, the use of the social perspectives and skills they were taught and decreased feelings of loneliness. The overall effect size for SRT, although small (d = +.21), is slightly larger than typically found

for community-level interventions (see Fishbein, 1996; Zatzick et al., 2009) as well as for prior studies of resilience training in organizational contexts (e.g., Adler et al., 2009; Castro, Adler, McGurk & Bliese., 2012; Fortney, Luchterhand, Zakletskaia, Zgierska, & Rakel, 2013; Hodges, 2010; Lester et al., 2011; Millear, Liossis, Shochet, & Biggs, 2008; Williams et al., 2007). These results demonstrated that training intact work groups in social resilience can improve self-reported use of these skills and that these skills can have an immediate impact on perceptions of loneliness. Perhaps just being armed with these alternative behaviors and aware of the value of social connection is enough to facilitate the sense of connection with one's immediate work group in a high-risk occupation. This impact, however, was limited in its impact and is not a simple panacea.

Soldiers in the SRT condition did *not* show overall improvements in how they felt about their platoon or the Army (i.e., work group attitudes), or how they felt about and interacted with family and friends (i.e., training generalization effects). On the positive side, these findings suggest that the survey responses showing improvements in social cognition were not an artifact of demand characteristics, expectancy effects, or placebo effects, but these findings also question whether any improvements in soldier resilience were achieved beyond specific targets of training. A second possibility is that, as in the case of physical fitness, it may not be sufficient to know or to begin to practice social fitness behaviors, it may also take time for these social behaviors to reshape the soldiers' interpersonal relationships and collective identities and then only if the soldiers continue to exercise what they learned during training under the auspices of a supportive platoon leadership. If this is the case, then work group attitudes and training generalization effects may take time and practice to manifest. Similarly, it may be that perception of one's internal state (e.g., loneliness) may be easier to identify whereas it may be more difficult

to perceive changes in the group and may require more direct experience (e.g., cohesion). Regardless of the reason, if it takes longer to identify changes in the group, it may also be that these changes will not occur because of the short-term nature of psycho-educational gains. Nevertheless, given short-term effects of social resilience training have now been identified, longer-term investigations are warranted. Consideration should also be given in future research to incorporating SRT into ongoing platoon training rather limiting the training to a single point in time.

We also investigated possible short-term adverse effects of the SRT on health and wellbeing. No evidence for an overall adverse effect was detected, and moderator analyses provided little evidence that the training had harmful effects on any subgroup. Moderator analyses pointed to possible personality characteristics and situations that may promote SRT efficacy. For instance, soldiers who had not been previously deployed also appeared to benefit more from SRT condition than soldiers who had been deployed previously, a finding that raises the possibility that providing SRT earlier rather than later in a soldier's career may produce larger training effects. The fact that the moderating effects were specific to the SRT suggests that these dispositions did not simply increase attention to Army training. Although additional research is needed, it may be that SRT builds on the strengths these soldiers bring, by disposition, to social resilience training.

Among the limitations of the present study are the modest statistical power and the emphasis on short-term outcomes. The former limitation was due in part to the unexpected deployment of 16 platoons that were scheduled to be involved in the study. We nevertheless detected training effects on topics that were the direct focus of training, and the effect sizes from this study should contribute to a growing body of work on resilience training. The focus on short

term outcomes is an important initial step to determine the extent to which the training is effective and safe. Questions about the persistence and generalization of training are now important to address. The use of one-tailed statistical tests to evaluate the statistical reliability of the effects of training on the target outcomes might also be questioned, but directional predictions regarding the targets of training were made a priori (as required by the double-dissociative randomized experimental design) based on a sizeable literature on social cognition, human relationships, and interventions for treating perceived isolation (e.g., Bolier et al., 2013; Cacioppo et al., 2011; Gable & Reis, 2010; Masi et al., 2011). Another limitation is the potential confound of social resilience training delivering information through collective learning activities whereas the cultural awareness activities relied on individual learning tasks. The degree to which these differences in training activities resulted in differential outcomes between the two conditions, rather than the content of training itself, is uncertain. Finally, some of the measures used short-term time referents whereas other outcomes measures used longer-term time referents. This difference in time course may have inadvertently biased what variables were found to be changed by the training given the short-term nature of the present study.

Among the strengths of the study are the double-dissociative randomized controlled study design (where platoons were randomly assigned to training conditions), the multi-level modeling to capture the hierarchical structure of the data, and testing the direct and indirect (potential training generalization & adverse) effects of the training. The double-dissociative randomized controlled study design offers important advantages. First, the experimental design was developed to provide a better control for potential confounding factors (e.g., awareness of being in a placebo or wait-list control group), general experimental artifacts especially when relying on self-reported outcome measures (e.g., demand characteristics, expectancy effects, Hawthorne

effects), experimental attrition due to the failure to see any treatment benefits, and treatment-contamination from cross-training. Second, the use of an active control group (as opposed to a wait-list control group or a group that never receives the training) minimizes the risk of biased data due to demand characteristics, placebo effects, Hawthorne effects, or poor compliance and careless responding that is more prevalent in non-active control groups. Moreover, with an active control group, all soldiers receive a training that is in fact informative and useful, decreasing the risk of cross-contamination. Finally, the "double dissociative" randomized controlled study permits an evaluation of the specific, directionally predicted effects of each experimental condition as well as a determination of any general effects of the training (e.g., expectancy effects; experimental mortality). This experimental design may prove useful in a wide range of intervention studies.

There was little evidence of domain general effects of the training, with the exception of the measure perceived social fitness, which showed significant and equivalent posttest improvements in both conditions. The improvement in both conditions may reflect the fact that soldiers in both conditions received training to improve their social awareness and behavior, and soldiers in both conditions showed improvements in domain specific areas of social behavior. (improved social cognition in the social resilience condition, reduced outgroup prejudice in the cultural awareness condition).

The finding that both training programs proved somewhat effective, at least for the targeted domains of social behavior, illustrates an ancillary benefit of the double-dissociative randomized controlled study design, which is that one can evaluate the efficacy of two distinct interventions (e.g., training programs) in the same study while controlling for any general effects of the training, including but not limited to experimental artifacts such as demand characteristics,

while also minimizing problems of treatment contamination from subjects in control conditions who receive treatment outside the confines of the experimental design. While not the focus of the present study, the cultural awareness training was effective in improving cultural knowledge and increasing positive attitudes toward Afghans. Given the call for more studies demonstrating the efficacy of cross-cultural training with military personnel (Caligiuri et al., 2011), the present study provides evidence that such training can be effective in changing attitudes measured by self-report.

In terms of theoretical contribution, the study moves the field forward by suggesting that social connection needs to be more explicitly studied in terms of context. Typically, loneliness research addresses social connection irrespective of the social context (work, friends and family). Yet the skills associated with building social connection in a work setting in which individuals are dependent on one another for survival (and not simply financial well-being) may not be the same skills as those associated with a circle of personal friends and family. Given that the effects of social resilience training were limited to relationships within the unit, the present study suggests that it is important to untangle these different venues for social connection and to determine not only how to boost social connection in each setting but also to identify if one setting is a more relevant target for relieving feelings of loneliness than another. The intense relationships inherent in military units, where terms like “band of brothers” and “battle buddy” are routinely used to characterize the strong connections, may be optimal for training in social resilience. Social resilience training may be less effective in other work settings such as factories or office work, where connections play less of a role in survival.

Alternatively, it may be that the impact of social resilience training was limited to work group factors (and did not expand to distal outcomes) because the training occurred in the

context of these work groups. It may not be that the skills failed to transfer to other contexts so much as the training itself was a joint experience and provided a kind of language for the unit to understand the importance of their social bonds. Perhaps the development of a specific set of skills is less important than a more global attitude of appreciating what the group's bonds have to offer, consistent with what Walton (2014) terms "wise interventions". Wise describes how specific psychological processes can be harnessed in simple ways to effect significant change in important social problems. Future research should examine the degree to which highlighting the bonds across the group serve to enhance that sense of connection, and the role that specific social skills play in enhancing those bonds.

Footnotes

1. Confirmatory factor analysis was conducted using SEM. The results suggested our five-factor latent structure was reasonable with RMSEA of 0.079 and CFI of 0.784. Analyses also confirmed the five-factor model is superior to models with fewer factors. For detail correlation tables of individual items within each variable set and of latent factors, please refer to supplementary material “Supplementory_Materials_SEM”.

2. Given only six of the participants in the social resilience condition and thirteen of the participants in the cultural awareness condition were female, we could not investigate the possible moderating effects of gender. However, the results reported in the text were unchanged when the analyses were repeated excluding the data from female soldiers.

3. Brigade was the highest level in our data structure. When it was included as Level 6, the ICC estimates revealed the values for Brigade were quite low (< .005). Although it could have been specified as Level 6, we decided to include it as a fixed effect variable because with only two brigades in the dataset, we might not have enough information to make appropriate distributional assumptions. By including the dummy-coded brigade predictor in the model, we allowed for conditional mean differences between the brigades, which essentially took the Brigade level of dependence into account. Results were not changed meaningfully when Brigade served on Level 6.

4. Exploratory moderator analyses were conducted by testing 17 unique potential moderators against all of the outcome variables. All of the significant results were reported in Supplementary_Materials_Moderator.

References

Abbe, A., & Gouge, M. (2012). Cultural Training for Military Personnel. *Military Review*.

Adam, E. K., Hawkley, L. C., Kudielka, B. M., & Cacioppo, J. T. (2006). Day-to-day dynamics of experience–cortisol associations in a population-based sample of older adults. *Proceedings of the National Academy of Sciences*, *103*(45), 17058-17063.

Adler, A. B., Bliese, P. D., McGurk, D., Hoge, C. W., & Castro, C. A. (2009). Battlemind debriefing and Battlemind training as early interventions with soldiers returning from Iraq: Randomization by platoon. *Journal of Consulting and Clinical Psychology, 77*, 928-940.

Adler, A. B., Bliese, P. D., Pickering, M. A., Hammermeister, J., Williams, J., Harada, C., Csoka, L., Holiday, B., Ohlson, C. (in press). Mental skills training with Basic Combat Training soldiers: A group randomized trial. *Journal of Applied Psychology*.

Adler, A. B., & Castro, C. A. (2013). The Occupational Mental Health Model for the Military. *Military Behavioral Health, 1*, 1-11. DOI:10.1080/21635781.2012.721063

Åkerlind, I., & Hörnquist, J. O. (1992). Loneliness and alcohol abuse: A review of evidences of an interplay. *Social science & medicine, 34*(4), 405-414.

Allen, N. J., & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance, and normative commitment to the organization. *Journal of Occupational Psychology, 63*, 1-18.

Avolio, B. J., & Bass, B. M. (2009). Multifactor Leadership Questionnaire (Third Edition). Menlo Park, CA: Mind Garden, Inc.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan, Eds., *Self-Efficacy Beliefs of Adolescents (pp.* 307–337). Greenwich, CT: Information Age Publishing.

Barefoot, J. C. Dodge, K. A., Peterson, B. L., Dahlstrom, W. G., Williams, R. B. (1989). The Cook-Medley Hostility Scale: Item content and ability to predict survival. *Psychosomatic Medicine, 51*, 46-57.

Bates, D., & Maechler, M. (2010). *lme4: Linear mixed-effects models using S4 classes* (Version 0.999375-35).

Bechara, A., Tranel, D., Damasio, H., Adolphs, R., Rockland, C., & Damasio, A. R. (1995). Double dissociation of conditioning and declarative knowledge relative to the amygdala and hippocampus in humans. *Science, 269,* 1115-1118.

Bernstein, D. P. et al. (2003). Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse & Neglect, 27,* 169-190.

Bolier, L., Haverman, M., Westerhof, G. J., Riper, H., Smit, F., & Bohlmeijer, E. (2013). Positive psychology interventions: A meat-analysis of randomized controlled studies. *BMC Public Health, 13,* 119-138. http://www.biomedcentral.com/1471-2458/13/119

Brailey, K., Vasterling, J. J., Proctor, S. P., Constans, J. I., & Friedman, M. J. (2007). PTSD symptoms, life events, and unit cohesion in U.S. soldiers: baseline findings from the neurocognition deployment health study. *Journal of Traumatic Stress, 20*(4), 495-503.

Brown, R. L., Leonard, T., Saunders, L. A., & Papsouliotis, O. (1997). A two-item screening test for alcohol and other drug problems. *Journal of Family Practice, 44,* 151-160.

Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Research, 28,* 193-213.

Cacioppo, J. T., Cacioppo, S., & Boomsma, D. (2014). Evolutionary mechanisms for loneliness. *Cognition & Emotion, 28,* 3-21.

Cacioppo, J. T., Hawkley, L. C., Berntson, G. G., Ernst, J. M., Gibbs, A. C., Stickgold, R., & Hobson, J. A. (2002). Do lonely days invade the nights? Potential social modulation of sleep efficiency. *Psychological Science, 13*(4), 384-387.

Cacioppo, J. T., Hawkley, L. C., Crawford, L. E., Ernst, J. M., Burleson, M. H., Kowalewski, R. B., ... & Berntson, G. G. (2002). Loneliness and health: Potential mechanisms. *Psychosomatic Medicine, 64*(3), 407-417.

Cacioppo, J. T., Hawkley, L. C., Ernst, J. M., Burleson, M., Berntson, G. G., Nouriani, B., & Spiegel, D. (2006). Loneliness within a nomological net: An evolutionary perspective. *Journal of Research in Personality, 40,* 1054-1085.

Cacioppo, J. T., Hawkley, L. C., & Thisted, R. A. (2010). Perceived social isolation makes me sad: Five year cross-lagged analysis of loneliness and depressive symptomatology in the Chicago Health, Aging, and Social Relations study. *Psychology and Aging, 25*(2), 453-463. doi: 10.1037/a0017216

Cacioppo, J.T. & Patrick, W. (2008). *Loneliness: Human nature and the need for social connection.* New York: W.W. Norton & Company.

Cacioppo, J. T., Reis, H. T., & Zautra, A. J. (2011). Social resilience: The value of social fitness with an application to the military. *American Psychologist*.

Caligiuri, P., Noe, R., Nolan, R., Ryan, A. M., & Drasgow, F. (2011). *Training, developing, and assessing cross-cultural competence in military personnel*. Technical Report #1284. Technical Report US Army Research Institute.

Caspi, A., Harrington, H., Moffitt, T. E., Milne, B. J., & Poulton, R. (2006). Socially isolated children 20 years later: risk of cardiovascular disease. *Archives of pediatrics & adolescent medicine*, *160*(8), 805-811.

Castro, C. A., Adler, A. B., McGurk, D., & Bliese, P. D. (2012). Mental health training with soldiers four months after returning from Iraq: Randomization by platoon. *Journal of Traumatic Stress, 25,* 376-383.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24,* 385–396.

Collange, J., Fiske, S. T., & Sanitioso, R. (2009). Maintaining a positive self-image by stereotyping others: Self-threat and the stereotype content model. *Social Cognition, 27,* 138-149.

Cook, W. W., & Medley, D. M. (1954). Proposed hostility and Pharisaic virtue scales for the MMPI. *Applied Psychology, 38,* 414–418.

Cornum, R., Matthews, M. D., & Seligman, M. E. P. (2011). Comprehensive soldier Fitness: Building resilience in a challenging institutional context. *American Psychologist, 66,* 4-9. Doi: 10.1037/a0021420

Cramér, H. (1946). *Mathematical methods of statistics*. Princeton, NJ: Princeton University Press.

Christakis, N. A., & Fowler, J. H. (2013). Social contagion theory: Examining dynamic social networks and human behavior. *Statistics in Medicine, 32*, 556-577. doi:10.1002/sim.5408

Dalal, R. S., Lam, H., Weiss, H. M., Welch, E. R., & Hulin, C. L. (2009). A within-person approach to work behavior and performance: Concurrent and lagged citizenship-counterproductivity associations, and dynamic relationships with affect and overall job performance. *Academy of Management Journal, 52,* 1051-1066.

Davis, M. (1980). A multidimensional approach to individual differences in empathy. JSAS *Catalog of Selected Documents in Psychology, 10,* p. 85.

Deluga, R. J. (1995). The relation between trust in the supervisor and subordinate organizational citizenship behavior. *Military Psychology, 7,* 1-16.

Dolan, C. A., & Adler, A. B. (2006). Military hardiness as a buffer of psychological health on return from deployment. *Military Medicine, 171*, 93-98.

Eidelson, R., & Soldz, S. (2012). *Does Comprehensive soldier Fitness work? CSF research fails the test*. Coalition for an Ethical Psychology, Working Paper No. 1. Retrieved from http://www.ethicalpsychology.org/Eidelson-&-Soldz-CSF_Research_Fails_the_Test.pdf

Eisenberger, R., & Huntington, R. (1986). Perceived organizational support. *Journal of Applied Psychology, 71*, 500-507.

Fishbein, M. (1996). Great expectations, or do we ask too much from community-level interventions? *American Journal of Public Health, 86,* 1075-1076. doi: 10.2105/AJPH.86.8_Pt_1.1075

Fiske, S. T., Cuddy, A. J. C., & Glick, P. (2007). Universal dimensions of social cognition: warmth and competence. *Trends in Cognitive Sciences, 11*, 77-83.

Fortney, L., Luchterhand, C., Zakletskaia, L., Zgierska, A., & Rakel, D. (2013). Abbreviated mindfulness intervention for job satisfaction, quality or life, and compassion in primary care clinicians: A pilot study. *Annals of Family Medicine, 11*, 412-420.

Gable, S. L., & Reis, H. T. (2010). Good news! Capitalizing on positive events in an interpersonal context. *Advances in Experimental Social Psychology, 42*, 195-257.

Gabrenya Jr, W. K., Griffith, R. L., Moukarzel, R. G., Pomerance, M. H., & Reid, P. (2012). *Theoretical and practical advances in the assessment of cross-cultural competence*. Defense Technical Information Center Report. http://www.dtic.mil/dtic/tr/fulltext/u2/a564931.pdf

Goldberg, L. R. (1992). The development of markers for the Big-five factor structure. *Journal of Personality and Social Psychology, 59*, 1216–1229.

Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr. (2003). A very brief measure of the Big Five personality domains. *Journal of Research in Personality, 37, 504-528.*

Griffith, J. (1988). Measurement of Group Cohesion in U. S. Army Units. *Basic and Applied Social*

Psychology, *9*, 149-71.

Griffith, J. (2002). Multilevel analysis of cohesion's relation to stress, wellbeing, identification, disintegration, and perceived combat readiness. *Military Psychology, 14*, 217-239.

Hawkley, L. C., Browne, M. W., & Cacioppo, J. T. (2005). How can I connect with thee? Let me count the ways. *Psychological Science, 16*, 798-804.

Hawkley, L. C., Hughes, M. E., Waite, L. J., Masi, C. M., Thisted, R. A., & Cacioppo, J. T. (2008). From social structural factors to perceptions of relationship quality and loneliness: The Chicago Health, Aging, and Social Relations Study. *Journal of Gerontology: Social Sciences, 63B*(6), S375-S384.

Hawkley, L. C., Masi, C. M., Berry, J. D., & Cacioppo, J. T. (2006). Loneliness is a unique predictor of age-related differences in systolic blood pressure. *Psychology and aging*, *21*(1), 152.

Hays, R. D., Sherbourne, C. D., Mazel, R. M. (1993). The RAND 36-Item Health Survey 1.0. *Health Economics, 2*, 217-227.

Hodges, T. D. (2010). An experimental study of the impact of psychological capital on performance, engagement, and the contagion effect. *ProQuest Dissertations and Theses*, 114.

Hoge, C. W., Auchterlonie, J. L., & Milliken, C. S. (2006). Mental Health Problems, Use of Mental Health Services, and Attrition From Military Service After Returning From Deployment to Iraq or Afghanistan. *JAMA, 295*(9), 1023-1032. doi: 10.1001/jama.295.9.1023

Hoge, E. A., Austin, E. D., & Pollack, M. H. (2007). Resilience: Research evidence and conceptual considerations for posttraumatic stress disorder. *Depression and anxiety*, *24*(2), 139-152.

Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social Relationships and Mortality Risk: A Meta-analytic Review. *PLoS Med, 7*, e1000316. doi:10.1371/journal.pmed.1000316

Leary, M.R. (1983). Social anxiousness: The construct and its measurement. *Journal of Personality Assessment, 47*, 66-75.

Lester, P. B., Harms, P. D., Herian, M. N., Krasikova, D. V., & Beal, S. J. (2011, December). *The Comprehensive soldier Fitness program evaluation. Report #3: Longitudinal analysis of the impact of Master Resilience training on self-reported resilience and psychological health data*. Retrieved from http://dma.wi.gov/dma/news/2012news/csf-tech-support.pdf

Lucas, R. E. & Donnellan, M. B. (2012). Estimating the reliability of single-item life satisfaction measures: Results from four national panel studies. *Social Indicators Research*, 105, 323-331.

Masi, C. M., Chen, H. Y., Hawkley, L. C., & Cacioppo, J. T. (2011). A meta-analysis of interventions to reduce loneliness. *Personality and Social Psychology Review, 15*, 219-266. PM ID number: 20716644; doi: 10.1177/1088868310377394.

Mayer, R. C. & Davis, J. H. (1999). The effect of the performance appraisal system on trust for management: A field quasi-experiment. *Journal of Applied Psychology, 84*, 123-136.

McGurk, D., Sinclair, R.R., Thomas, J.L., Merrill, J., & Bliese, P.D. (2014). Destructive and Supportive Leadership and Mental Health in Combat. Accepted for publication at *Journal of Military Behavioral Health, 2*, 240-256. doi: 10.1080/21635781.2014.963765

Meade, A. W., & Craig, S. B. (2012). Identifying careless responses in survey data. Psychological Methods. Advanced Online Publication. doi: 10.1037/a0028085

Millear, P., Liossis, P., Shochet, I. M., & Biggs, H. (2008). Being on PAR: Outcomes of a pilot trial to improve mental health and wellbeing in the workplace with the promoting adult resilience

(PAR) program. *Behaviour Change, 25*, 215-228.

Mulligan, K., Fear, N. T., Jones, N., Wessely, S., & Greenberg, N. (2011). Psycho-educational interventions designed to prevent deployment-related psychological ill-health in Armed Forces personnel: A review. *Psychological Medicine, 41*, 673-686.

Ong, A. D., Fuller-Rowell, T., & Bonanno, G. A. (2010). Prospective predictors of positive emotions following spousal loss. *Psychology and Aging*, in press.

Peterson, C., & Villanova, P. (1988). An expanded attributional style questionnaire. *Journal of Abnormal Psychology, 97*, 87-89.

Podsakoff, P. M., & MacKenzie, S. B. (1994). Organizational citizenship behavior and the quantity and quality of work group performance. *Journal of Marketing Research, 31*, 351- 363.

Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. (1990). Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *Leadership Quarterly, 1,* 107-142.

R Development Core Team. (2011). *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing.

Rehg, M. T., Gundlach, M. J., & Grigorian, R. A. (2012). Examining the influence of cross-cultural training on cultural intelligence and specific self-efficacy. *Cross Cultural Management: An International Journal, 19,* 215 – 232. doi: http://dx.doi.org/10.1108/13527601211219892

Reich, J. W., Zautra, A., & Hall, J. S. (2010). *Handbook of adult resilience*. New York: Guilford Press.

Reis, H. T., Smith, S. M., Tsai, F., Rodrigues, A., & Maniaci, M. R. (2010). Are you happy for me? How sharing positive events with others provides personal and interpersonal benefits. *Journal of Personality and Social Psychology, 99*, 311-329.

Rosenberg, M. (1956). Misanthropy and political ideology. *American Sociological Review, 21*, 690-695.

Rotenberg, K. J., Addis, N., Betts, L. R., Corrigan, A., Fox, C., Hobson, Z., Rennison, S., Trueman, M., & Boulton, M. J. (2010). The relation between trust beliefs and loneliness during early childhood, middle childhood, and adulthood. *Personality and Social Psychology Bulletin, 36*, 1086-1100.

Russell, D. (1996). UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment, 66,* 20–40.

Russell, D. W., Whalen, R. J., Riviere, L. A., Clark-Walper, K., Bliese, P. D., Keller, D. D., Pangelian, S. I., & Thomas, J. L. (2014). Embedded behavioral health providers: An assessment with the Army National Guard. *Psychological Services, 11*, 265-272.

Schagen, I., & Elliot, K. (2004). *But what does it mean? The use of effect sizes in educational research*. Rotherham: B & B Press.

Silvera, D. H., Martinussen, M., & Dahl, T. I. (2001). The Tromso Social Intelligence Scale, a self-report measure of social intelligence. *Scandinavian Journal of Psychology, 42*, 313-319.

Smith, H. M., & Betz, N. E. (2000). Development and validation of a scale of perceived social self-efficacy. *Journal of Career Assessment, 8*, 283-301.

Spector, P. E., & Jex, S. M. (1998). Development of four self-report measures of job stressors and job strain: Interpersonal Conflict at Work Scale, Organizational Constraints Scale, Quantitative Workload Inventory, and Physical Symptoms Inventory. *Journal of Occupational Health Psychology, 3*,356-367.

Spitzer, R., Kroenke, K., & Williams, J. (1999). Validation and utility of a self-report version of PRIME-MD: The PHQ Primary Care Study. *Journal of the American Medical Association, 282*, 1737-1744.

Stanley, S. M., Allen, E. S., Markman, H. J., Rhoades, G. K., & Prentice, D. L. (2010). Decreasing divorce in U.S. Army couples: Results from a randomized controlled trial using PREP for strong bonds. *Journal of Couple & Relationship Therapy, 9*, 149-160.

Stravynski, A., & Boyer, R. (2001). Loneliness in Relation to Suicide Ideation and Parasuicide: A Population-Wide Study. *Suicide and Life-Threatening Behavior*, *31*(1), 32-40.

Sweeney, P. J., Thompson, V. D., & Blanton, H. (2009). Trust and influence in combat: An interdependence model. *Journal of Applied Social Psychology, 39*, 235-264.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Pearson Education.

VanderWeele, T. J., Hawkley, L. C., Thisted, R. A., & Cacioppo, J. T. (2011). A marginal structural model analysis for loneliness: Implications for intervention trials and clinical practice. *Journal of Clinical and Consulting Psychology, 79*, 225-235. doi: 10.1037/a0022610

van Orden, G. C., Pennington, B. F., & Stone, G. O. (2001). What do double dissociations prove?. *Cognitive Science*, *25*(1), 111-172.

Walton, G. M., (2014). The new science of wise psychological interventions. *Current Directions in Psychological Science, 23*, 73-82, doi: 10.1177/0963721413512856

Wilk, J. E., Bliese, P. D., Kim, P. Y., Thomas, J. L., McGurk, D., & Hoge, C. W. (2010). Relationship of combat experiences to alcohol misuse among U.S. soldiers returning from the Iraq war. *Drug and Alcohol Dependence, 108*(1-2), 115-121.

Williams, A., Hagerty, B. M., Andrei, A. C., Yousha, S. M., Hirth, R. A., & Hoyle, K. S. (2007).

STARS: Strategies to assist Navy recruits success. *Military Medicine, 172*, 942-949.

Williams, K. D. (2007). Ostracism: The kiss of social death. *Social and Personality Psychology Compass, 1*(1), 236–247. doi:10.1111/j.1751-9004.2007.00004.x

Zatzick, D. F., Koepsell, T., & Rivara, R. P. (2009). Using target population specification, effect size, and reach to estimate and compare the population impact of two PTSD preventive interventions. *Psychiatry, 72*, 346-359.

Table 1. Sample characteristics by Social Resilience Training (SRT) and Cultural Awareness Training (CAT) condition.

	SRT (N=346)	CAT (N=235)	Statistical test
Age	24.3 (*SD*=4.3)	24.6 (SD=4.9)	$t(579) = 0.69$
Female (percent)	3.5%	2.5%	$\chi2(1) = 0.64$
High-school diploma	98.3%	97.9%	$\chi2(1) = 0.13$
Married or living with partner	48.7%	52.2%	$\chi2(1) = 1.14$
Jr Enlisted status	77.7%	78.7%	$\chi2(1) = 0.08$
Previous deployment	79.2%	67.5%	$\chi2(1) = 10.04$**

*p < .05, **p < .01, ***p < .001

Table 2 Group x Time Interaction Outcomes

Social cognition (Variable Set #1)

	Group*Time Coefficient					
Outcome variables	**B**	**SE**	**P[1]**	**ID level SD**	**Adjust[2]**	**Effect size**
Overall test – Social cognition	0.13	0.07	0.04	0.61	1	0.21
Beliefs in social fitness	0.12	0.06	0.02	0.52	1	0.22
Empathy	0.11	0.05	0.02	0.37	1	0.29
Generalized trust	0.02	0.02	ns	0.29	1	0.09
Hostility	-0.01	0.02	ns	0.15	-1	0.08
Military hardiness	0.12	0.05	0.01	0.70	1	0.16
Perceived isolation	-0.54	0.31	0.04	4.66	-1	0.12
Perceived social fitness	0.02	0.05	ns	0.62	1	0.03
Perspective taking	0.10	0.05	0.04	0.45	1	0.21
Practicing social skills	0.13	0.04	0.00	0.42	1	0.31

Work group attitudes (Variable Set #2)

	Group*Time Coefficient					
Outcome variables	**B**	**SE**	**P[1]**	**ID level SD**	**Adjust[2]**	**Effect size**
Overall test – Work group attitudes	0.04	0.03	ns	0.50	1	0.08
Collective platoon efficacy	0.06	0.06	ns	0.72	1	0.08
Counterproductive work behavior	-0.01	0.06	ns	0.51	-1	0.02
Organizational trust	0.03	0.05	ns	0.72	1	0.04
Organizational citizenship behavior	0.11	0.05	0.02	0.48	1	0.23
Platoon cohesion and support	0.05	0.05	ns	0.68	1	0.07
Platoon conflict	0.06	0.06	ns	0.64	-1	-0.09
Platoon relationship satisfaction	0.07	0.06	ns	0.77	1	0.10
Treatment of the weakest link	0.04	0.07	ns	0.53	1	0.08

Afghanistan cultural awareness and outgroup prejudice (Variable Set #3)

	Group*Time Coefficient					
Outcome variables	**B**	**SE**	**P[1]**	**ID level SD**	**Adjust[2]**	**Effect size**
Overall test – Outgroup knowledge and prejudice	-0.51	0.05	< 0.001	0.33	1	-1.52
Cultural awareness (Afghan knowledge)	-1.63	0.11	< 0.001	0.70	1	-2.33

Outgroup prejudice - warmth	0.61	0.10	< 0.001	0.95	-1	-0.64
Outgroup prejudice - competence	0.00	0.10	ns	0.79	-1	0.00
Perceived competence of Afghans	-0.09	0.08	ns	0.65	1	-0.13
Perceived warmth of Afghans	-0.67	0.08	< 0.001	0.72	1	-0.92
Perceived competence of Americans	-0.08	0.06	ns	0.59	1	-0.14
Perceived warmth of Americans	-0.04	0.07	ns	0.60	1	-0.07

Potential training generalization effects (Variable Set #4)

	Group*Time Coefficient					
Outcome variables	**B**	**SE**	**P**	**ID level SD**	**Adjust [2]**	**Effect size**
Overall test – Training generalization effects	0.02	0.05	ns	0.51	1	0.04
Malingering beliefs	-0.05	0.09	ns	0.72	-1	0.07
Organizational commitment	0.12	0.06	0.05	0.90	1	0.13
Perceived organizational support	-0.03	0.08	ns	0.87	1	-0.04
Satisfaction with personal relationship	-0.06	0.06	ns	0.64	1	-0.09

Health and wellbeing (Variable Set #5)

	Group*Time Coefficient					
Outcome variables	**B**	**SE**	**P**	**ID level SD**	**Adjust [2]**	**Effect size**
Overall test – Health and wellbeing	0.06	0.04	ns	0.77	1	0.08
Alcohol misuse	-0.05	0.04	ns	0.36	-1	0.14
Anxiety	0.03	0.06	ns	0.60	-1	-0.05
Catastrophizing	0.01	0.05	ns	0.70	-1	-0.02
Depressive symptoms	-0.01	0.03	ns	0.52	-1	0.01
Life satisfaction	0.20	0.12	ns	1.88	1	0.11
Mood	0.12	0.15	ns	1.80	1	0.07
Perceived stress	-0.07	0.06	ns	0.63	-1	0.11
Sleep quality	0.04	0.06	ns	0.71	1	0.05
Vitality	0.05	0.07	ns	0.92	1	0.06

1. One-tailed
2. Adjusted for direction to simplify the presentation/interpretation of results, refer to Data Analytic Plan section for details.

Figure 1. CONSORT Flow Diagram for Social Awareness and Action Training (SAAT).

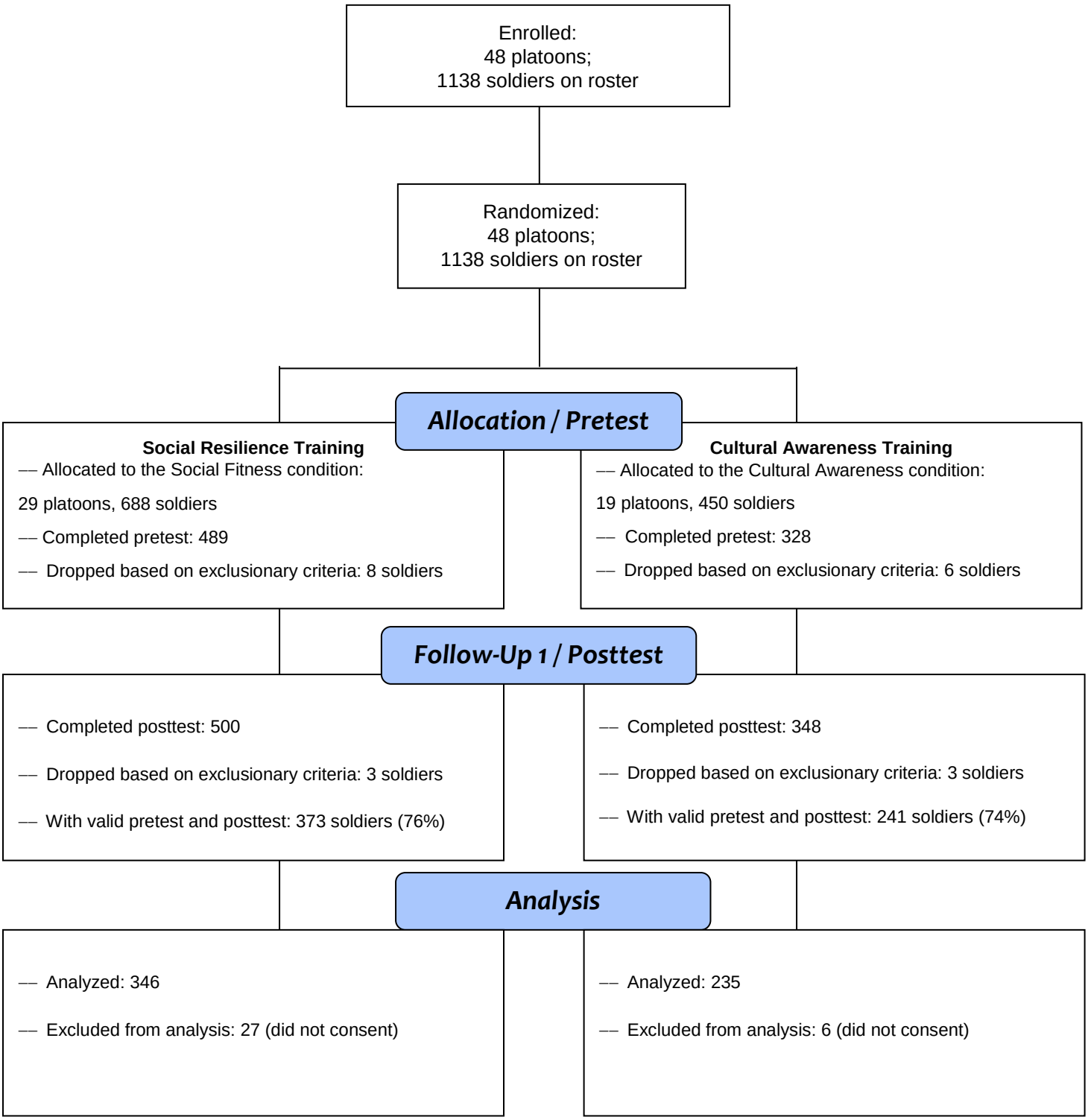


Figure 2. Mean Summary Pretest and Posttest Scores for Social Resilience and Afghanistan Cultural Awareness Training Conditions on the Outcome Measures of Social Cognition (Top Panel), Work Group Attitudes (Middle Panel), and Afghanistan Cultural Awareness and Outgroup Prejudice (Bottom Panel)

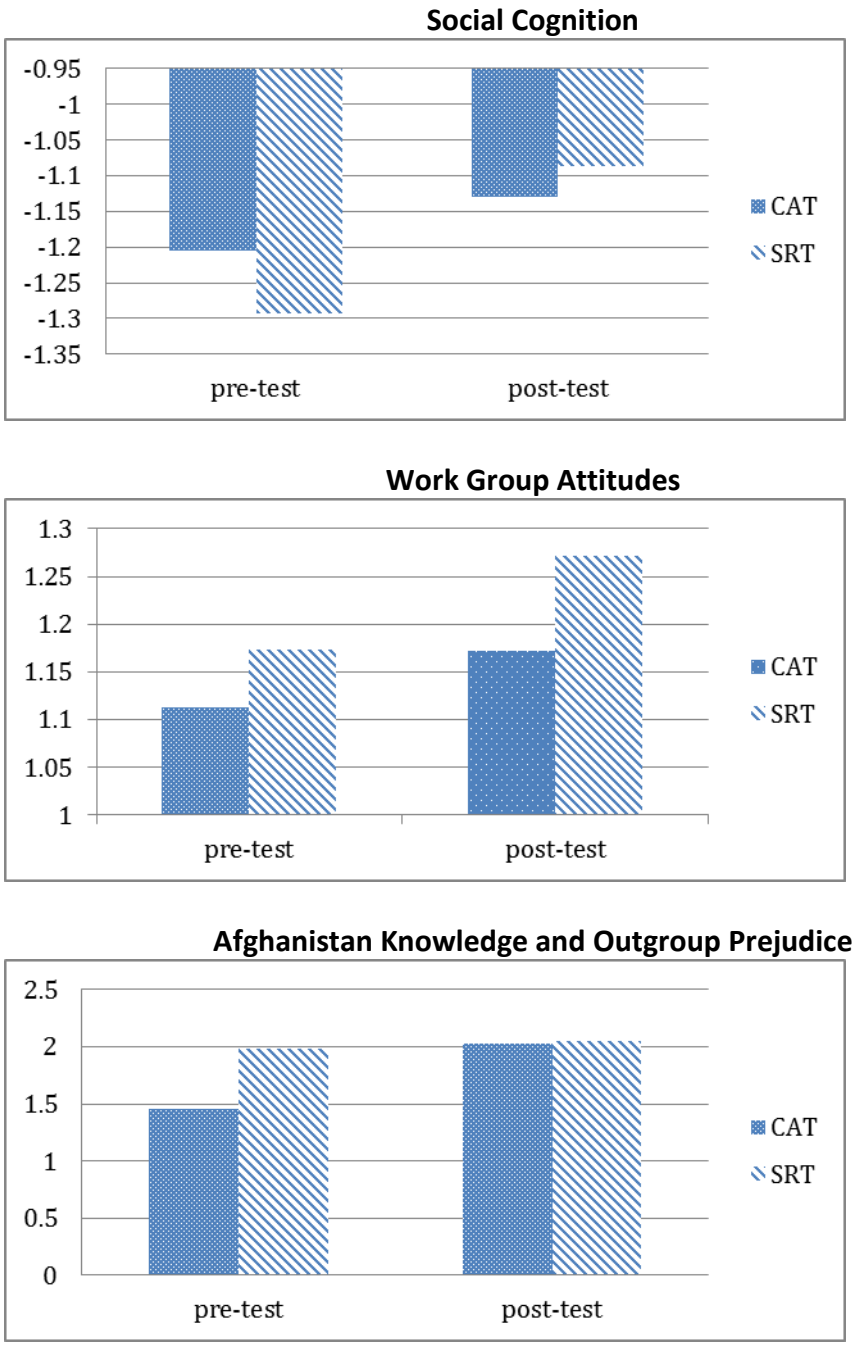
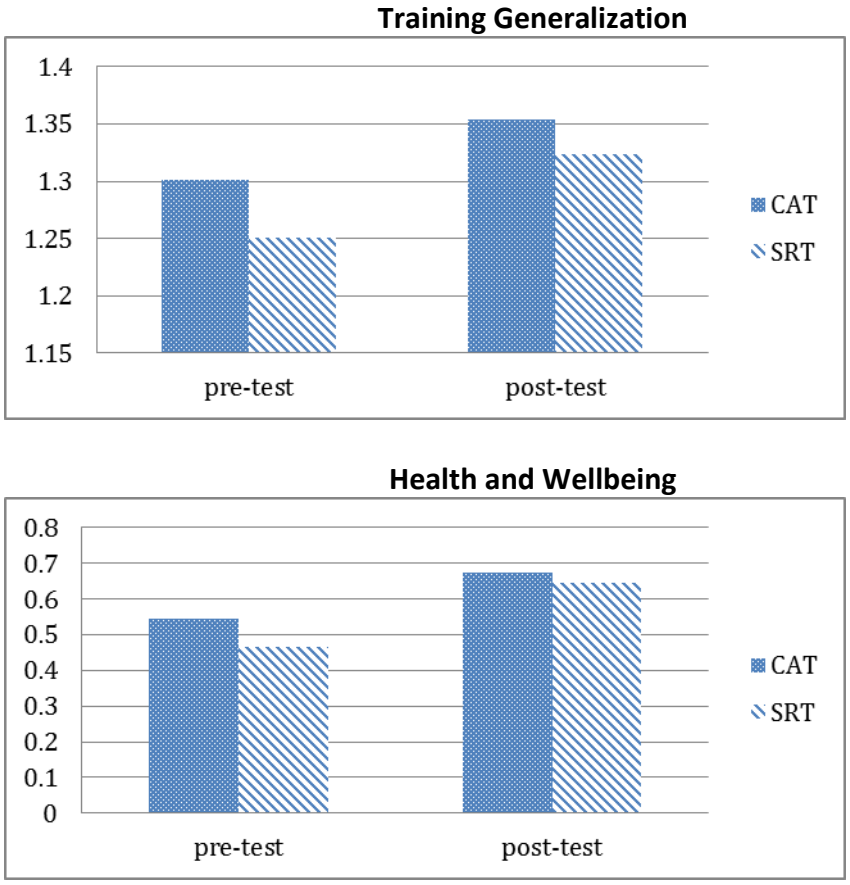


Figure 3. Mean Summary Pretest and Posttest Scores for Social Resilience Training and Afghanistan Cultural Awareness Training Conditions on the Outcome Measures of Potential Training Generalization Effects (Top Panel) and Health and Wellbeing (Bottom Panel)



APPENDIX B

BRIEF OVERVIEW OF TRAINING MATERIALS

I. Social Awareness and Action Training (SAAT) SKILLS

The primary goal of the social fitness training is to increase social resilience at the level of the individual, increase squad cohesion, and decrease loneliness given its known effects on depression and stress levels. Decreasing loneliness requires a change in social cognition and behavior and, with time, improvements in the quality of social relationships. The immediate goal of SAAT is to teach Soldiers: (a) new, more constructive and productive ways of thinking about other people (social perception and cognition), (b) new social skills to improve their social interactions with others; and (c) the importance of practicing these new skills and ways of thinking to improve their social resilience. The materials constituting the social fitness training include the following:

	Skill or Principle	Description
SESSION 1	**Survival Skills**	
	Survival of the fittest	Illustrates how survival of the fittest in social species, including humans, is more about one's social fitness than physical fitness
	Social pain	A Soldier must learn to endure and deal with physical pain and with social pain. Learn the "reality" of social pain in its various manifestations (e.g., distance from loved ones, ostracism, rejection, bereavement) and appreciate its direct comparability to physical pain in terms of neural representation in the brain and its consequences for individual and platoon performance and effectiveness. Appreciate the role others have in producing and mitigating social pain.
	Malleability of social fitness	Learn that social fitness is like physical fitness. It can be improved with regular practice or exercise, on and off-duty. Physical and social fitness should be lifelong lifestyles.
	Benefits of social fitness	Describes scientifically documented benefits of social fitness for individuals and for the groups in which they live and work.
	"Mind" Reading	The human brain spontaneously extracts information about the mental states of others – what they are like, what they think, and what

	Skill or Principle	Description
		they feel. Many of these social perceptions and inferences are inaccurate, however. With training, one's social perceptions and inferences can become more accurate.
	Mind-Reading: Perspective-taking	Learn how to take the perspective of others and gain insight into the thoughts, feelings and intentions of others.
	Develop an action plan to achieve change	Make a personal plan to strengthen a specific skill and include strategies to be employed when confronted with obstacles to goal; build the deliberate practice of interpersonal skills into your lifestyle.
	Verify	Learn the fallibility and biases when you think you know what someone else is thinking or feeling, and take steps to verify the accuracy of your interpretations. Learn the various ways in which to verify and correct your social perceptions and inferences
SESSION 2	**Improving Mind Reading**	
	Mind-Reading: Reading facial expressions	Improve perspective-taking and mind reading by learning what accurate and inaccurate information is conveyed in artificial, static, slow, and fast facial signals; improve ability to recognize emotions and other mental states in facial expressions. Learn to verify what you think you see while avoiding behavioral confirmation processes.
	Mind-Reading: Reading facial expressions Rapid Signals	Rapid facial signals reflect expressive movements created by contractions of the muscles of mimicry. Train how the read these signals, how these signals can mislead a perceiver, which signals are more informative than others, and how to determine what the signals really mean.
	Mind-Reading: Reading eyes in particular	Improve perspective-taking ability by learning how to recognize emotions in the eyes alone; learn why eyes are more reliable than lower facial expressions in determining emotional states and intentions. Learn to verify what you think you see while avoiding behavioral confirmation processes.
	Mind-Reading:	Slow facial signals reflect folds and wrinkles that

	Skill or Principle	Description
	Reading facial expressions Slow Signals	are created by a lifetime of contractions of the muscles of mimicry. Train how to read these signals, how these signals can mislead a perceiver, which signals are more informative than others, and how to determine what the signals really mean.
	Mind-Reading: Reading facial expressions Artificial Signals	Artificial facial signals reflect facial signals that are the result of items or materials that are added (e.g., glasses, make-up, tattoos). Train how to read these signals, how these signals can mislead a perceiver, which signals are more informative than others, and how to determine what the signals really mean.
	Mind-Reading: Reading facial expressions Static Signals	Static facial signals are structural features of the face (e.g., facial shape, coloration, texture). Train how to read these signals, how these signals can mislead a perceiver, which signals are more informative than others, and how to determine what the signals really mean.
	Behavioral Confirmation	The principles of behavioral confirmation and self-fulfilling prophecy are covered, and steps to avoid these thinking traps are trained.
	Mind-Reading: Reading body posture	Improve perspective-taking ability by learning how body posture influences the meaning of verbal content. Learn to verify what you think you see while avoiding behavioral confirmation processes.
	Reading tone of voice	Improve perspective-taking ability by learning how tone of voice influences the meaning of the verbal content. Learn to verify what you think you see while avoiding behavioral confirmation processes.
SESSION 3	**Learning to Connect at a Distance**	
	Connecting Forces: Mirror Processes Mimicry	Learn that mimicry is a means of social contagion that can be used for the good or ill of the unit, and how to distinguish between the two.
	Connecting Forces: Mirror Processes Empathy, Sympathy and Synchronicity	Understand key mechanisms and pathways (means) through which social contagion is promulgated, and how these means can be manipulated to positively enhance or improve relationships.

	Skill or Principle	Description
	Connecting Forces: Interpersonal reciprocity & network reciprocity	Understand the natural human tendency to reciprocate or exchange good for good, bad for bad. Recognize when interpersonal reciprocity needs to be countered for the good of interpersonal and unit relationships. Learn that network reciprocity operates through the social reputation one earns, and how to improve one's social reputation.
	Connecting Forces: Social contagion	Learn that people's attitudes, ideas, emotions, and behaviors spread across a social network, and learn how to stop such contagion processes.
	Connecting Forces: Trust	Learn what it means to be trustworthy and how to become trustworthy. Learn, also, how to judge the trustworthiness of others.
	Connecting Forces: Social surveillance	Learn that social surveillance involves more than looking out for the other guy, it also involves monitoring the environment for long-term as well as short-term threats to the safety of one's self, buddy, and unit.
	Connecting Forces: Compete for the right reasons	Learn the difference between selfish and selfless competition. Selfish competition boosts the self at the expense of others in the unit (e.g., insulting fellow platoon member); selfless competition benefits the unit and boosts the performance of everyone (e.g., squad challenges). Learn how to engage in selfless competition (e.g., fairness and sportsmanship are key).
	Connecting Forces: Cooperate for the right reasons	Learn the difference between selfish and selfless cooperation. Selfish cooperation boosts the self at the expense of others in the unit (e.g., collusion); selfless cooperation benefits the unit even if it doesn't directly benefit individual members (standing another Soldier's post)
SESSION 4	**Expanding Unit Cohesion**	
	Identify and develop unit identity	Develop a positive unit identity that transcends the particular individuals currently in the unit (loyalty to current and former members regardless of status). Compare unit identity with fan identification with an athletic team that is maintained regardless of changes in players. Learn how to teach new Soldiers in the platoon

	Skill or Principle	Description
		the unique identity of your unit.
	Know and share unwritten rules	Learn how norms shape behavior; identify the norms of your unit and your family; recognize the positive and negative effects of norms individually, interpersonally, and collectively, in the platoon and Army-wide, as well as in the family. Learn, too, how to teach these rules to new Soldiers in the unit.
	Group Mind versus Group Think	Learn how highly cohesive, effective groups cultivate a 'group mind', or collective intelligence, to achieve efficiencies and focus the group for task completion (mission accomplishment). Recognize the symptoms of group mind 'gone bad' (Group Think), and learn how to combat, minimize, or reverse these negative effects.
	Share good times with the unit (Capitalization)	Learn to recognize the contributions others (perhaps subtly) made to your successes; learn how to share positive experiences and good news with those who contributed to these successes; choose the right way, right time, right place & right person.
	Embracing differing points of view	Learn the benefits of a diversity of facts, opinions, beliefs, capacities, and backgrounds can be used to improve the quality of decisions made by a group
SESSION 5	**Building Social Resilience**	
	Stick together during bad times and share negative experiences with the unit	Learn when and how to share your negative experiences with others; recognize that negative moods can spread if not explicitly acknowledged and dealt with; learn the value of shared negative experiences for unit identity and how to turn adversities to promote advantage/growth.
	Effective communication (constructive *speaking* as well as constructive listening)	What is said is filtered through a listener's expectations and prior knowledge. Learn good speaking and good listening skills; practice inclusive humor, honesty, and humility. Learn the possible short-term gains but significant long-term costs that come from dishonest communications.
	Prevent social pain from	Learn how to break out of the spiral of social

	Skill or Principle	Description
	spreading	isolation using "EASE": Extend yourself (deliberate effort to make face-to-face connections); Awareness and Action Plan (to counter tendencies to focus on the negative); Selection (of compatible connections); Expect the best (to leash the power of the self-fulfilling prophecy). Learn how the platoon can recognize and help the isolated platoon member re-connect, as well.
	Transform emotions into actionable intelligence	Learn how to transform raw data about emotions (e.g., physiological changes like heart rate; experiences like pride) into information (e.g., interpretations of the emotional experience) that inform the choice of response options. Understand that the appropriate response is situationally dependent.
	Develop flexibility in assuming social roles	Improve role flexibility: learn to identify a gap and to take initiative/step up to fill that gap, even if it means leaving comfort zone if necessary. Learn the importance of personal courage in resisting conformity or role pressures
SESSION 6	**Dealing with Your and with Others' Feelings of Isolation**	
	Social Connection Continuum: Social connections are rewarding, while social disconnection is painful	Learn that social pain is a signal, that both social connection and disconnection have the same effects on biology, behavior, and the brain as physical rewards or pain.
	Social Connection Continuum: Coping with one's feeling of social isolation	Learn to identify indicators of social isolation and how to cope with these feelings.
	Social Connection Continuum: Coping with others' feelings of social isolation	Learn to identify indicators of social isolation within another person and ways to help them cope with these feelings.
	Social Connection Continuum: Good listening, good speaking, good communication	Learn how you as an individual, and you as a member of a unit, can most effectively deal with another Soldier who feels socially isolated from friends, family, or battle buddies
	Perspective-taking	Learn how taking the perspective of a Soldier who feels isolated can help form a salubrious connection between the platoon and the affected Soldier
	Verify	Learn more about the various ways in which to verify and correct your social perceptions and

	Skill or Principle	Description
		inferences to permit a more genuine and effective connection between you, the platoon, and the affected Soldier
SESSION 7	**Conflict Resolution**	
	Effective Conflict Resolution: Defining Conflict	Learn to identify conflict and its effect on interpersonal relationships, unit cohesion, and group performance.
	Effective Conflict Resolution: Know when to avoid or address conflict	Learn when conflict is best avoided versus addressed.
	Effective Conflict Resolution: Know how to address conflict	Learn appropriate ways to address conflict; distinguish between constructive (focus on finding solutions) versus non-constructive (focus on finding fault or blame) and selfish (the outcome that is best for me and/or worst for you) versus selfless (the outcome that is best for all) ways of addressing conflict. Learn ground rules of conflict resolution (e.g., be fair, prevent escalation, respect differences, and focus on the specific issues in dispute).
	Effective Conflict Resolution: De-escalating conflict	Learn methods for de-escalating the tension and emotion that can arise when a conflict erupts.
	Effective Conflict Resolution: Selfish versus Selfless Conflict Resolution	Learn methods to distinguish between selfless and selfish conflict resolution and the consequences of each.
	Effective Conflict Resolution: Guidelines for Conflict Resolution	Learn conflict resolution guidelines (ground rules) and when to apply them to deal with conflict with others.
	Effective Conflict Resolution: Conflict Resolution when the other person persists	Learn how to apply skills to end a conflict when the other person will not stop and continues to pursue the issue.
	Effective Conflict Resolution: Know how to exit the blame game	Learn methods for handling conflict that is more about assigning blame than about solving problems or ensuring the situation that led to the conflict is improved.
	Effective Conflict Resolution: The Unit's role in Conflict Resolution	Learn appropriate skills the unit (members) can use to address conflict and work to resolve issues that affect interpersonal relationships, unit cohesion, and group performance.
SESSION 8	**Summary and Review**	
	Capstone Exercise(s)	Participants identify and apply social fitness skills and principles acquired during training to

Skill or Principle	Description
	various real-life scenarios they have encountered or they are likely to encounter. The scenarios promote a review of all of the principles and skills covered during the training program.

II. Cultural Awareness (Resilience) Training

As in the Social Fitness arm, the Cultural Awareness arm of the design consisted of eight 50-minute training sessions. However, the target outcome was to educate Soldiers about the culture, history, and diversity of the people of Afghanistan and to lower outgroup prejudice toward the people of Afghanistan. These eight sessions of training are:

1. Cultural awareness & geography

Importance of cultural awareness in a military context; overview of Afghanistan geography

2. History

Important leaders & events from Afghanistan's history

3. Religion

Pillars and practices of Islam; divisions within Islam

4. Ethnic groups & social customs

Ethnicities in Afghanistan; moral & social codes; rude vs. polite behaviors

5. Economy & politics

Natural resources; labor issues; opium production

6. Recreation

Sports, art, dance, music, film

7. Food, dress, health & education

Muslim dietary code; common foods; forms of women's dress; health status

8. Capstone exercise

To integrate all content with scenarios Soldiers might encounter in Afghanistan